1660 Vol. XLVI AUGUST 17th, 1944

FLIGHT

and

AIRCRAFT ENGINEER

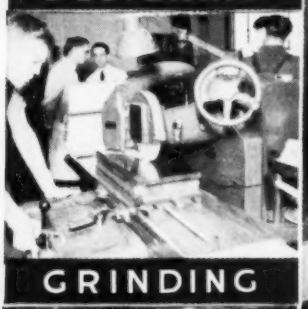
OFFICIAL ORGAN OF THE ROYAL AERO CLUB ONE SHILLING

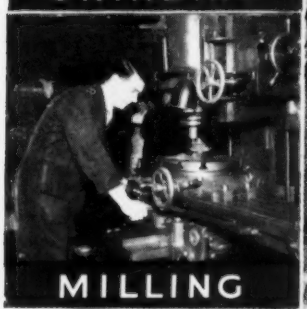
RETURN TO "A 2" LIBRARY

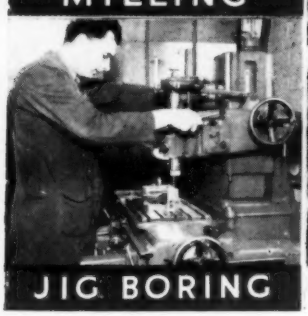
CORK MANUFACTURING CO. LTD., SOUTH CHINGFORD, LONDON, E.4. Telephone : Silverthorn 2666 (7 lines)

(Associated with Flexo Plywood Industries Ltd.)

DESIGNING


GRINDING


MILLING


JIG BORING

The Tools that will finish the Job

Specialists in

JIGS & FIXTURES

PRESS TOOLS

AIRCRAFT ASSEMBLY JIGS & REFERENCE GAUGES

CAPSTAN LATHE WORK

HEAT TREATMENT

SMALL ASSEMBLY HAND TOOLS

FULLY A·I·D APPROVED

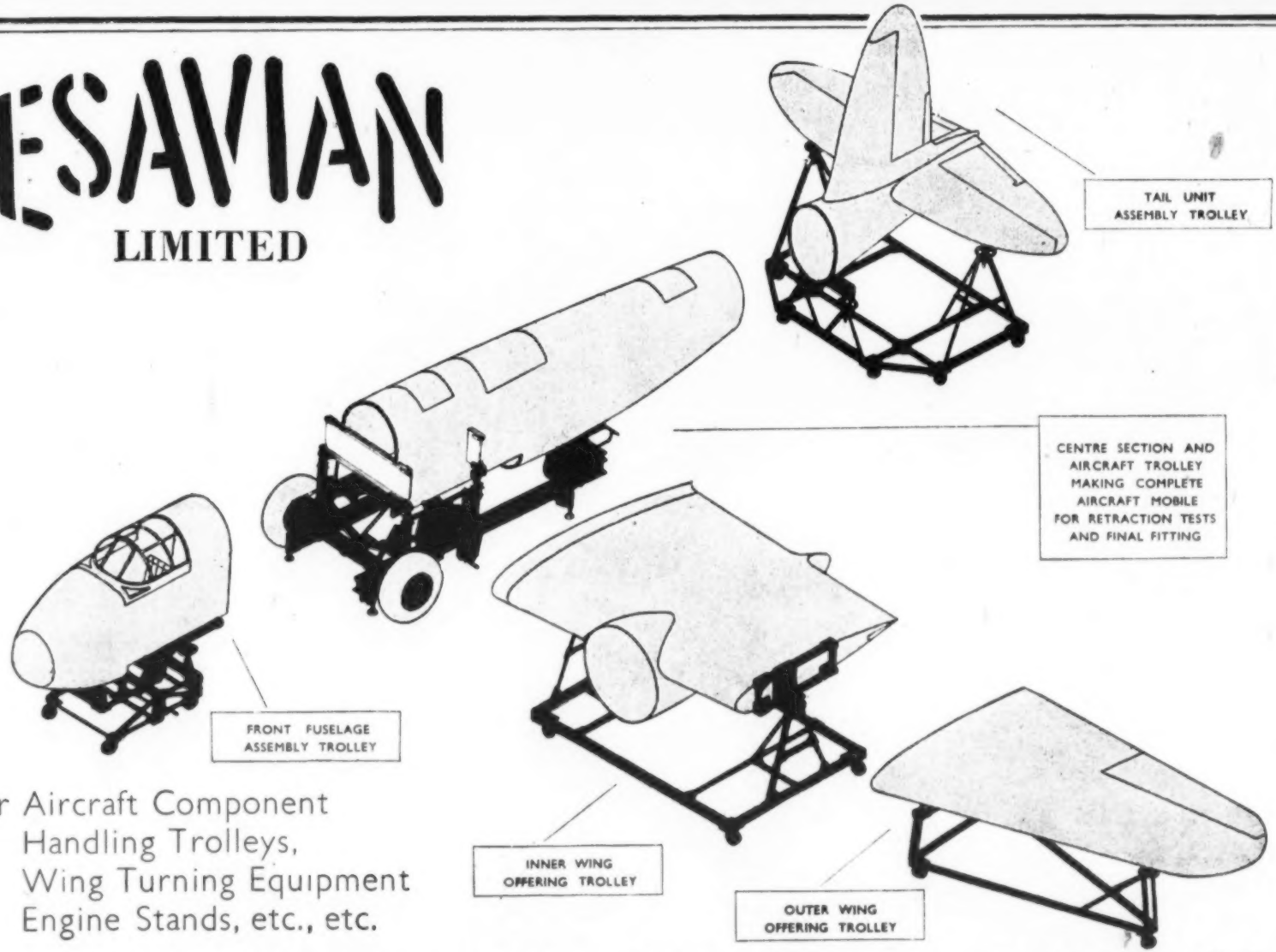
GAUGE & TOOL MAKERS ASSOCIATION

Leytonstone

JIG & TOOL Co. Ltd.

606 HIGH ROAD, LEYTON, LONDON, E.10. PHONE: LEYTONSTONE 5022-3 GRAMS: LEYTOOL, LEYSTONE

ESAVIAN
LIMITED



for Aircraft Component
Handling Trolleys,
Wing Turning Equipment
Engine Stands, etc., etc.

Head Office: ESAVIAN HOUSE, HIGH HOLBORN, LONDON, W.C.1

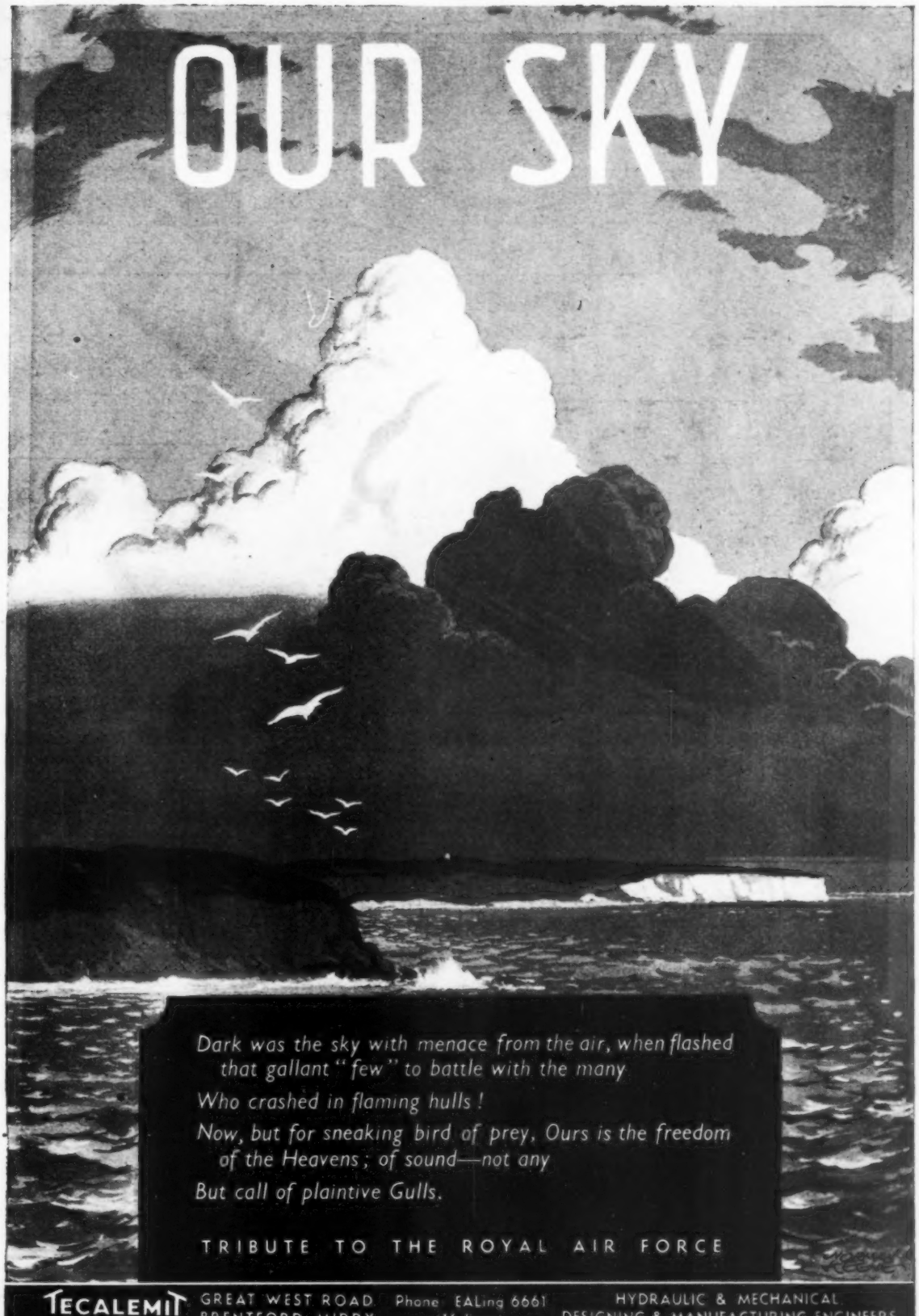
Quality

PORTABLE ELECTRIC TOOLS

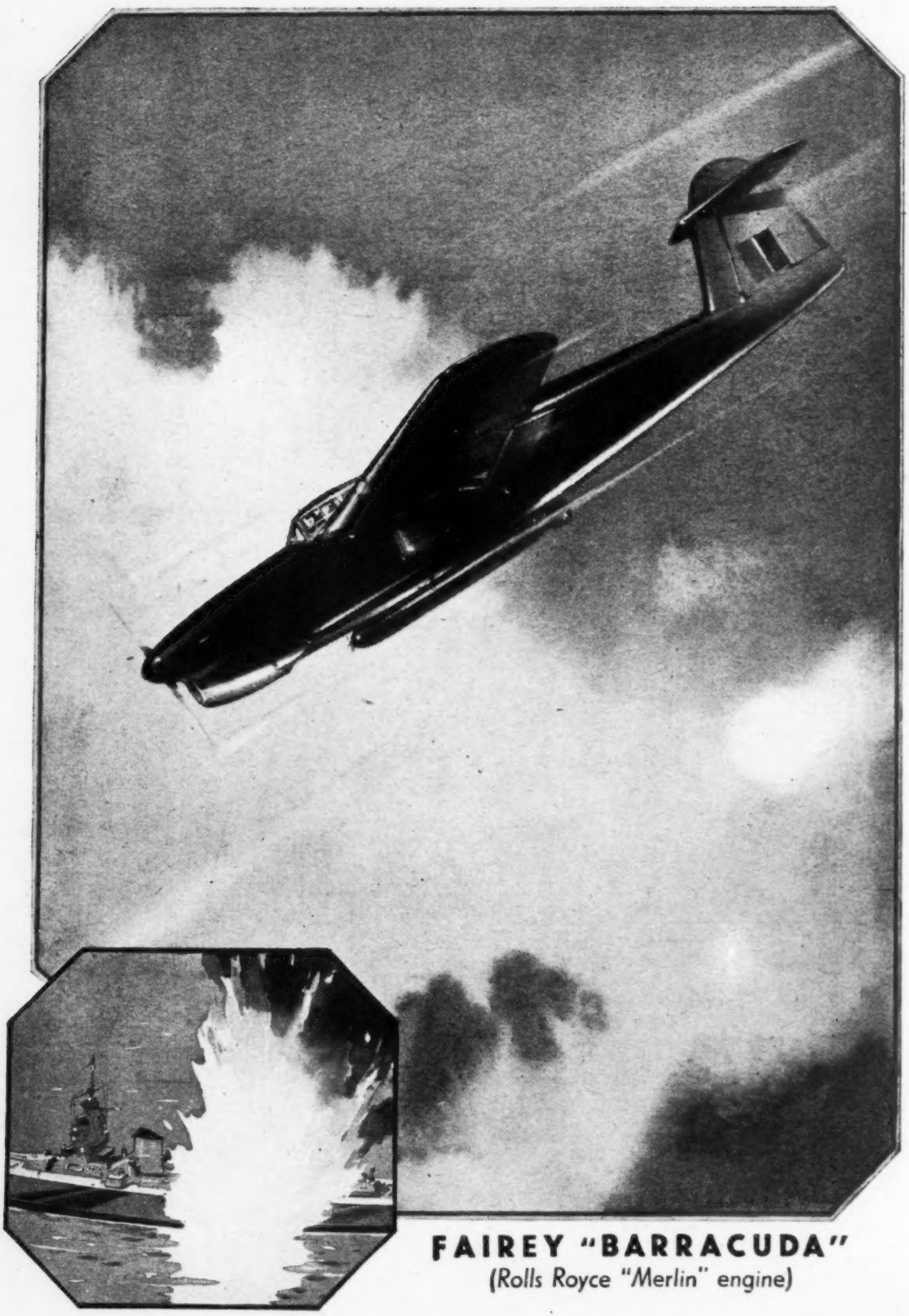
Regd. **WOLF**

S. WOLF & CO. LTD., PIONEER WORKS, HANGER LANE, LONDON, W.5. PERivale 5631-3

1218


OUR SKY
Dark was the sky with menace from the air, when flashed
that gallant "few" to battle with the many
Who crashed in flaming hulls!
Now, but for sneaking bird of prey, Ours is the freedom
of the Heavens; of sound—not any
But call of plaintive Gulls.
TRIBUTE TO THE ROYAL AIR FORCE

TECALEMIT LIMITED GREAT WEST ROAD BRENTFORD MIDDX Phone EALing 6661 (16 lines) HYDRAULIC & MECHANICAL DESIGNING & MANUFACTURING ENGINEERS



FAIREY "BARRACUDA"
(Rolls Royce "Merlin" engine)

FLIGHT
and
AIRCRAFT ENGINEER

FIRST AERONAUTICAL WEEKLY IN THE WORLD : FOUNDED 1909

Editor
C. M. POULSEN

Managing Editor
G. GEOFFREY SMITH, M.B.E.

Chief Photographer
JOHN YOXALL

Editorial, Advertising and Publishing Offices: DORSET HOUSE, STAMFORD STREET, LONDON, S.E.1
Telegrams: Truditur, Sedist, London. Telephone: Waterloo 3333 (35 lines).

COVENTRY: 8-10, CORPORATION ST. Telegrams: Autocar, Coventry. Telephone: Coventry 5210.
BIRMINGHAM, 2: GUILDHALL BUILDINGS, NAVIGATION ST. Telegrams: Autopress, Birmingham. Telephone: Midland 2971 (5 lines).
MANCHESTER, 3: 260, DEANSGATE. Telegrams: Iliffe, Manchester. Telephone: Blackfriars 4412.
GLASGOW, C.2: 26B, RENFIELD ST. Telegrams: Iliffe, Glasgow. Telephone: Central 4857.

Registered at the G.P.O. as a Newspaper.

No. 1860. Vol. XLVI. August 17th, 1944 Thursdays, One Shilling.

The Outlook

Aircraft in Battle

A TIME will come when the history of the present war will be written by British authorities. The Admiralty will doubtless publish its own account, and that, it is to be hoped, will include the contribution made by Coastal Command. Still more is it to be hoped that the remaining air operations and the doings of the Army will not be kept apart in separate volumes issued by the War Office and the Air Ministry respectively; for it would be really impossible to understand either set of operations by itself. The Air Ministry might well publish its own account of the offensive by Bomber Command against German production; but for the rest the Army and the Air Force have worked as one team, and a reader could hardly grasp the significance of what the one was doing without a clear exposition of what its fellow was engaged upon at the same time. As General Eaker once said, the chief interest of the campaign in Africa was the development of the Tactical Air Force

The recent fighting in Normandy and Brittany has produced examples of new uses of the air arm which will require chapters of explanation in the coming history. Heavy bombers are now used regularly in tactical operations, by day as well as by night, although it is not long since authorities considered that class of aircraft unsuitable for tactical work. That has been made possible by the recent increase of accuracy in bomb-aiming. Heavies are even used for bombarding targets within the range of the artillery, which shows a change in considered opinion on the subject. Would this have been impossible but for the practical elimination of the *Luftwaffe*, or could our overwhelming strength in fighters still have made it practicable and desirable? The future history must answer these and other questions.

Then, in the German attack on the Americans at Mortain last week, the local American commander disregarded the red-tape procedure of asking for air support, and sent a request directly to an R.A.F. Group of rocket-firing Typhoons. The result was most satisfactory. In a few minutes these deadly machines were over the critical spot, with the result that 139 German tanks were destroyed or damaged, as well as a great number of supply lorries and other vehicles. The German attempt to break through to Avranches and cut off the American forces in the Cherbourg peninsula from those in Brittany was disastrously defeated. This may lead to a complete overhauling of the system by which the Army calls for air support—another point to be discussed in the coming war history.

The Air and the Invasion

A GREAT deal of light has been thrown on the part played by air power in the invasion of France by the full explanation given last week by Air Chief Marshal Sir Trafford Leigh-Mallory. The bulk of his statement is given on another page of this issue.

For weeks before D-Day everyone could realise that the Air Forces of Britain and America had undertaken a huge programme of disrupting the communications of the enemy; but it opens one's eyes to be told that if there had been no Air Force on either side "the invasion would not have been on" because the Germans would have been able to build up their forces at a speed which would have made it impossible to invade with any hope of success. In addition, the destruction of the enemy's radiolocation posts enabled the Allies to achieve surprise. As things have turned out, the Germans have had to detrain reinforcements as far away as Mulhouse, Nancy and Bar-le-Duc. Movements by day had (said Sir Trafford) been brought almost to a standstill, and enemy reinforcements had sometimes taken several days

over a journey which would normally take only a few hours.

In the six weeks before D-Day the enemy had naturally been anxious to learn our plans. He attempted 129 reconnaissance flights over our ports, but only 11 of them got through. Consequently his information was extremely scrappy just at a time when full information would have been worth anything to him. And, we may add, the Germans have shown undoubted signs of being quite bewildered by the speed with which the American armour has dashed across Brittany, and then turned eastwards in the direction of Paris. Again, air reconnaissance has failed them.

Looking to the future, this summary by Sir Trafford Leigh-Mallory is full of comfort to an island kingdom like Great Britain. Within the last four years we British have known what it is to live in fear of an invasion. That fear was dispelled by the victory of our fighters (and A.A. guns) over the enemy's bombers. It follows that if we can always maintain a force of fighter aircraft which can master enemy bombers and enemy reconnaissance aircraft, an invasion of Great Britain "will not be on."

The Airborne Army

THE latest new formation, namely, the Airborne Army, as it is certain to be generally called, has been formed by General Eisenhower as Supreme Commander of the Allied Forces of Liberation. No other authority could have formed it, for it includes both British and American units. It is entirely outside the jurisdiction of both the War Office and the Air Ministry.

The general public has been given only the most meagre accounts of the part played by airborne troops in the invasion of Normandy. It was, therefore, something of an eye-opener to hear that General Eisenhower has admitted that it was because of his great faith in them that he was able to give the "Go" signal on D-Day, and he doubted whether the operation in France could have taken place without the services of airborne warriors. In an address to some of the men last week he added that through their effective employment we should end this war far more quickly than we could without them.

CONTENTS

The Outlook	165
War in the Air	167
For Photographic Recce.	172
Here and There	174
Avro York	176
V.C. for Canadian Pilot	180
Behind the Lines	181
Beaufighter Strikes	182
Cadets Build a Cadet	184
Aircraft in Flying Attitudes	185
Correspondence	186
Service Aviation	187

These were very emphatic words, and they show that the science and art of using airborne soldiers has advanced a long way since the first gallant, but not highly successful, landings in Calabria by some British parachutists a couple of years or so ago.

A natural corollary to such words by our Supreme Commander must be that when the present war is over a strong airborne contingent must form part of the regular British forces. The question then arises, shall it be under the War Office or under the Air Ministry? The First Airborne Division in the British forces was raised and trained by General Browning and Air Commodore Sir Norman Nigel, working in unison. In the future will the fighting men belong to the R.A.F. Regiment and the whole force be administered by the Air Ministry, or will the troops be soldiers of the Army carried in aircraft belonging to the War Office?

Airborne troops are almost certainly the best instrument for restraining would-be aggressor nations after the Armies of Occupation have been withdrawn, and their organisation is therefore a matter of great moment. We should like to suggest that they should be directly under the Ministry of Defence, rather than under either the War Office or the Air Ministry. After all, the modern tendency is to unify our forces rather than to split them up, and the Airborne Army seems the obvious first step towards unification.

JAP'S EYE VIEW: The latest B-29, Superfortress; photographs showing the open doors of the two capacious bomb bays.

WAR in the AIR

Atlantic Battle Won on Land : Japan Bombed Again—Likewise the Philippines : Airborne Army Formed

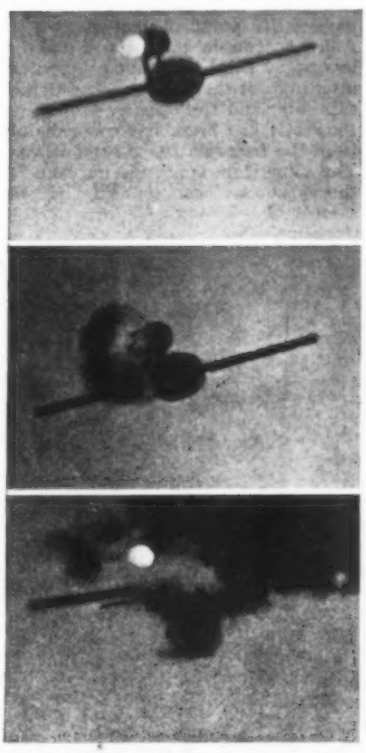
IT was cheering news when we were told last week that General Eisenhower had transferred his headquarters from England to France. It obviously implied that a certain mark in the progress of the invasion had been passed. Only a fraction of France has yet been liberated, but the prospect of a landing in the Riviera has not been ruled out. At the moment of writing it would seem that the forces ready in Corsica are only waiting for General Alexander to gain possession of the Grande Corniche road along the coast from Italy, by which (in the bad old days) Mussolini sent his troops along into Menton and Nice. General de Gaulle has told us that a French Army will soon be taking part in the liberation of the country, and Corsica would seem its natural springboard.

What a splendid page in military history has been the dash of American armour into Brittany! It has, of course, been immensely facilitated by the Allies' command of the air. The Germans evidently did not know where the Americans were going next, and showed complete bewilderment. A few reconnaissance aircraft would have made the position clear, but the Henschels (or whatever—if any—has taken their place) would have merely been indulging in suicide if they had ventured within the cognisance of the American screen of protective fighters. So American armour dashed on headlong towards Brest, Lorient and St. Nazaire. It was assumed (and no doubt rightly) that the Germans would make hurried efforts to get their U-boats away before those bases were seized from the land. So heavy bombers were sent to interfere with the attempts at escape. Some 12,000 lb. bombs crashed through the concrete roofs of the submarine pens, while others created tidal waves in the harbours which must have got into the pens from below and would create havoc inside.

In addition to these attacks, Lancasters paid a visit to La Pallice—the place connected with one of the adventures of the *Scharnhorst*—which might have been the goal to which some of the U-boats would fly, and treated it to a heavy dose of bombs. These raids by Lancasters were made by day, with fighter cover.

In dealing with U-boats the Navy

BATTLEFIELD SUPPORT : A Typnoon pilot "scrambles" on getting a target from a forward visual control point.



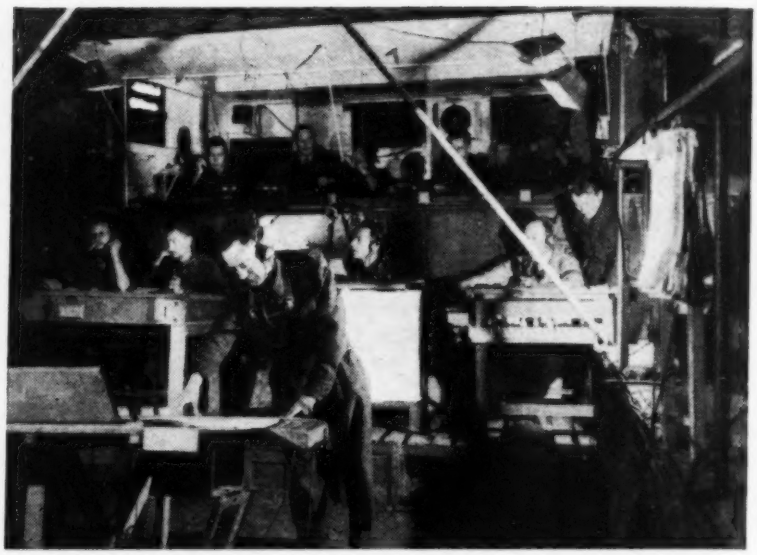
BUZZ-BOMB BLITZ : An air torpedo, attacked by A.D.G.B. aircraft, blows up over the English Channel.

WAR IN THE AIR

and Coastal Command of the R.A.F. work together, and so do the British and American forces. In consequence, reports about the totals destroyed are issued, not by the Admiralty or Air Ministry, but under the joint signatures of the Prime Minister and the President of the United States. One was issued last week, and stated that since the beginning of the war the number of U-boats sunk now exceeds 500. That is a most satisfactory number, and it exceeds the number of merchant ships sunk by a substantial margin. Of the U-boats which tried to interfere with our cross-Channel traffic since D.-Day 17 have been sunk. The U-boat fleet is admitted to be still of impressive size, but the captains are now very cautious (not being anxious to swell that figure of 500), and they are now the hunted rather than the hunters. We await the View Hulloa.

The capture of these three Breton submarine bases (which may well have been completed by the time these words are published) must have a tremendous effect on the Battle of the Atlantic. For practical purposes that battle has already been decided in favour of the Allies; but the struggle has been going on, and ships crossing the Atlantic in convoy have not been free from all anxieties. The number of sinkings has diminished until it has passed the point of real danger to Allied success in the war. Nevertheless, some ships have not escaped the attentions of the more resolute U-boat captains; and the danger, diminished though it has been, has come mainly from the bases on the Bay of Biscay. The American approach by land to those bases, accompanied by the shower of heavy bombs from R.A.F. aircraft, must reduce the remaining risk to an enormous extent.

CHANNEL RESCUERS: An Air/Sea rescue wireless operator calls up another launch with his Aldis lamp.



CONTROL IN FRANCE: Operations rooms travel with Group H.Q. when in the field. They perform the same functions as the static operations rooms at home plus the handling of requests received from visual control points in the front line.

The stubborn courage of the crews of the British and American merchant ships has been one of the most glorious episodes of the war, and all the Allies will rejoice to think that a great proportion of the dangers which they faced has now been removed. In addition, it is very gratifying to think that now fewer valuable cargoes will be sent down to the locker of Davy Jones.

In the Far East

IN his last review of the war the Prime Minister said: "I am increasingly led to believe that the interval between the defeat of Hitler and the defeat of Japan will be shorter—perhaps much shorter—than I at one time had been led to suppose."

Helping to bear out those encouraging words, some Super-Fortresses of the 20th Bomber Command went out again last week in medium strength to bomb Nagasaki in Japan. Another Group from the same Command bombed the oil refinery at Palembang in Sumatra. These announcements came from New York.

Allied Headquarters in New Guinea added the news that bombers have raided Japanese airfields at Davao in Mindanao Island in the southern Philippines. This was the first bombing attack on the Philippines since the fall of Corregidor over two years ago. It must have given particular satisfaction to Gen. MacArthur, who was the hero of the stubborn American resistance at Corregidor.

Reports from Japan all indicate a growing sense of the parlous condition in which the prospects of the country now stand. The task lying before the new Prime Minister cannot be one which makes for complete peace of mind.

An Airborne Army

GENERAL EISENHOWER'S decision to set up his headquarters in France has been accompanied by another innovation. All airborne forces, British and American, have been combined in one Command, which is approximately the size of an Army. Its G.O.C. is Lt.-Gen. Brereton, who has hitherto been in command of the U.S. Army 9th Air Force. This veteran force was formed in the Mediterranean, but was brought across to Great Britain in order to make use of its experience in backing up the invasion. General Brereton has, therefore, plenty of knowledge of what the Army of Liberation wants from the air weapon.

It is now the invariable rule that where an American officer is in command he should be assisted by a British officer, and vice versa. So the second-in-command is Lt.-Gen. Browning, who worked with the late Air Commodore Sir Nigel Norman in training the 1st Airborne Division in the British Forces. It was a very

WAR IN THE AIR

happy partnership by men of two different Services.

Some light has been thrown on the importance of airborne troops by General Eisenhower himself who, after decorating some U.S. airborne troops in Normandy, said: "In airborne operations lies one of our great opportunities for further success."

A Blinded Army

ON the first page of this article comment was made on the evident ignorance of the Germans about the direction in which the American armour would move next. For days the British public was kept in equal ignorance. The second Battle of France had reached the almost ludicrous position that the only way in which the Germans could find out what the position had become was from Allied broadcasts. Their own aircraft could give them no guidance.

Such a position had never before arisen in the course of this war. That a General should be able to conceal from the enemy the main trend of his manœuvres had never seemed a possibility, now that aircraft had provided the eye in the air. Sceptics who had doubted the efficiency of aircraft as a weapon, always admitted that it would provide information about what was happening "on the other side of the hill." But so completely had the *Luftwaffe* been swept out of the skies that it seemed well worth while to the Allied commanders to refrain from publishing news about the movements of the American armour, which they felt sure the Germans would be unlikely to find out for themselves. The eastward thrust to Le Mans was reported, and then silence descended.

On Saturday, August 12th, the Germans realised at last that if they were to stand any chance of getting their 7th Army out of the pincers rapidly closing in on it they had better start moving without delay. At 2 p.m. that day the Allied reconnaissance aircraft saw the first signs of the retreat. The Germans were actually moving by day, and a fine bright summer day at that. The roads between Falaise on the north and Argentan on the south were choked with vehicles of all sorts moving eastward with all the speed they could muster.

Naturally every bomber and fighter-bomber which Sir Trafford Leigh-Mallory could raise immediately dashed at this magnificent target. In the narrow gap between the towns mentioned above there are only two main roads, and the enemy had to make what use he could of by-paths. The slaughter of vehicles was terrific.

MODERN DIVE-BOMBERS: Typhoons in Normandy being overhauled. In the foreground are the short-finned 1,000-lb. bombs used by the Typhoons when they adopt the dive-bombing technique.

Relation of Air to War

Commander-in-Chief of the A.E.A.F. Speaks on the Invasion and the War in France

FROM OUR OWN CORRESPONDENT AT S.H.A.E.F

THE high spot of the week at H.Q. has been the reception of the war correspondents by Air Chief Marshal Sir Trafford Leigh-Mallory, C.-in-C., Allied Expeditionary Air Forces. It was he who was responsible for the air side of the invasion plan, the brilliance of which is only just now becoming apparent. Using the destruction of the bridges of the Seine and the Loire as a means of preventing German reinforcement in the early stages, it is now going to make it almost impossible for the enemy to withdraw either men or material. It is only by recognising the bridgeless lower reaches of the Seine as one side of a very deep salient, that it becomes apparent what an unenviable position the enemy are in.

As an air operation it is likely to

Air Chief Marshal Sir Trafford Leigh-Mallory with Gen. Quesada of the U.S. 9th A.A.F. during a visit to Normandy.

RELATION OF AIR TO WAR

remain for many years as a classic and be discussed and quoted in every staff college the world over. The employment of heavy bombers to attack pin-point targets on the battlefield was Sir Trafford's own idea and responsibility. It has enabled the hard crust of modern defence to be pierced on each occasion on which it has been used. The following is Sir Trafford Leigh-Mallory's address.

In planning this great enterprise there were two main factors from the air point of view which were agreed between the Army Commander-in-Chief and myself as being essential preliminaries to the battle.

They were:

(i) First, that we must have absolute air superiority with a view not only to protecting our own Forces from enemy air attack, but also to enable our own Air Forces to have freedom of action against the enemy.

(ii) Secondly, that we should deal with the enemy's communications in so effective a manner as to impose great delay in his build-up in the lodgment area.

It is no exaggeration to say that if there had been no Air Force on either side, that although the question of air superiority would not then have come into the calculations during the planning of the battle, the invasion would not have been on because the Germans, with the magnificent communications of Northern Europe, would have been able to build up their forces in the lodgment area at a speed which would have made it impossible for us to embark on the operation with any hope of success. It is, therefore, evident that the Allied Air Forces have had a most important role to fulfil.

In order to implement the air plans to ensure that the greatest weight of air power was brought to bear in the battle, the Allied Expeditionary Air Force was formed, and operations commenced on November 15th. This Force was composed of the Ninth U.S. Air Force—which is a very powerful force comprising medium bombers, light bombers and a very large number of fighters; and the Second British Tactical Air Force, which also included a light bomber force and fighters of all descriptions. Apart from these, which were directly under the command of the Air Commander-in-Chief, such effort from the Strategical Air Forces as was allotted to take part in the battle also operated under the direction of the A.E.A.F.

Reducing the *Luftwaffe*

I do not want to say more than is necessary about the war in the air as it was waged before D-Day, though, of course, it is true that for us the battle began long ago before the landing on the Normandy beaches. *But there is one fact worth remembering, and that is that it was the Allied air superiority which made the landing possible.* The G.A.F. could have prevented us making a successful landing. The steady reduction of the German Air Force has always been one of the chief objectives of the Allied Air Forces, especially the U.S. Eighth Air Force and the R.A.F. Bomber Command, who have waged a tremendous offensive (which is still going on) against the German aircraft industry. The deep penetration raids of the Eighth Air Force by fleets of heavy bombers, escorted by long-range fighters, not only destroy aircraft production in the factory and aircraft on the ground, but challenge the German fighters to combat in the air, and in all these ways the British and U.S. Bomber Commands have succeeded in reducing the once formidable G.A.F. to a parlous state.

Between November 15th, 1943 (on which date the A.E.A.F. was formed), and D-Day, A.E.A.F. aircraft alone destroyed 878 enemy aircraft in aerial combat. In the preparatory phase of the invasion, which may be taken as April 1st to D-Day, Allied Air Forces operating from the U.K. destroyed in air combat alone no less than 2,655 German aircraft. Since D-Day some 1,828 enemy aircraft have been destroyed in the battle area. Actually we are enjoying not only an air superiority, but what can only be called an air supremacy. In these tactical operations we have been able to do in the air pretty well what we like. Let me illustrate this by two examples:

In the months before the assault when we were building up our forces in the south of England, when all the south coast ports were crammed with shipping, and all the towns and fields along the coast were full of our troops and their equipment, these tempting targets remained secure from G.A.F. bombers under the shield of the A.E.A.F.

In the six weeks prior to D-Day, less than 400 enemy bombers operated on south coast targets, achieving absolutely negligible results, and of these 24 were destroyed with a further six probables. Also during the same six weeks period, only 129 enemy reconnaissance sorties were made of the south and east coasts, most of which were fleeting appearances in mid-Channel, and only 11 of these penetrated to the English coast. The meagreness of this reconnaissance effort and its obvious barrenness of results can be gauged when I tell you that we very frequently flew a greater number of photographic reconnaissances per day than the enemy total effort for the six weeks, and that does not take into account special visual, shipping and weather reconnaissances.

In the period April 1st to D-Day, Allied photographic reconnaissance aircraft flew almost 5,000 sorties. The dividend yielded from this effort in knowledge of the enemy defences, troop and train movements and other military information must be seen at first hand to be credited. Since D-Day photographic reconnaissance has been carried out ceaselessly over the battle front, and no less than 3,529 sorties have been flown on photographic missions alone.

Enemy Driven on to By-roads

The other and even more striking example of the air supremacy we have gained would be evident if I could take you on a flight over our beach-head and beyond into the country behind the enemy's lines. On our side of the lines you see the roads congested with military traffic, the beaches, the villages, the fields full of stores and equipment, tents and huts; behind the enemy's lines you see nothing—roads deserted, not a sign of movement on road or railway. Our ground forces can dispose themselves in this open way because they have little to fear from the air, and because they have the assurance of a continuous air protection. Our air superiority and the strength and constancy of our air attack have driven the enemy to cover up his tracks, to disperse his troops and supplies, to forsake the railways and the main roads, and to move only on by-roads at night. The waste of time and efficiency can be imagined.

I said that without Allied air superiority the plan to invade the Continent would not have been entertained. That places upon us the responsibility of giving material assistance to the forces on the ground. How have we given that assistance? First by keeping the enemy out of the sky, and secondly by reducing the opposition to the Allied assault. The notion of the "air canopy" and the terrific bombardment of the coast defences on D-Day are already familiar to the public at large, but this is only half our job, only half of what we were expected to do.

The great anxiety in the minds of those who planned the invasion was that the enemy might be able to build up forces to oppose our landing far more quickly than we could land them. The enemy in northern France had an excellent system of roads and railways, while our communications were across a wide stretch of sea, and, in the early stages, over beaches without the unloading facilities of a port. This is where the help of the air forces was required. It was our duty so to disrupt the enemy's lines of communication that he would be worse off than we were with our precarious Channel crossing and our open beaches. To explain what we have tried to do here, I shall have to go back to the months before D-Day, for the attack on the enemy's lines of communication began early in March. We had to ensure the delay of reinforcements to the enemy's forward troops when they became engaged with our invading forces. We had to slow down his build-up of men and supplies. This task could not be put off until D-Day.

To the uninitiated it may appear that you have only got to cut a railway track or destroy a bridge, and you have stopped the rail movement of reinforcements. But it isn't as easy as that. We began bombing the railway system of France early in March, and it was none too early. Our aim was to cause a progressive dislocation or paralysis in the transport system, so that when the day came and the battle in Normandy was joined, it might be possible to cut specific main routes with more decisive effect. Railway experts agreed that in a railway system so extensive as that of northern France no cutting of routes in the tactical phase could have much effect without carefully planned dislocation and reduction of potential in the preparatory phase. A mere cut in a line can be repaired within a few hours. A bridge takes days to repair, but the destruction of bridges by bombing is a difficult task, demanding fine weather, so it would be rash to trust to bridge-cutting alone. We did not, as I have said, promise the impossible; we did not hope or promise entirely to stop the flow of reinforcements. What we hoped to achieve and what we can claim to have achieved is to have delayed the enemy's rate of build-up. We have compelled him to detrain far from the battle; to expend his petrol and shorten the life of his tanks by travelling long distances by road; to throw his divisions into the battle piecemeal, short of tanks, ammunition, guns, and all kinds of supplies.

That was the purpose of the continuous attacks by the Allied

RELATION OF AIR TO WAR

Air Forces on railway marshalling yards, junctions, repair shops and loco-servicing facilities. There were eighty centres of railway activity where the repair and servicing facilities were such that they wanted special attacks. By D-Day no less than fifty-one of these were put completely out of action for the time being, and a further twenty-five were very severely damaged. To accomplish this, 22,000 aircraft sorties were flown, and more than 66,000 tons of bombs were dropped.

The destruction of bridges before D-Day was very largely the task of the medium and fighter-bombers of the U.S. Ninth Air Force. The daylight bombers of U.S. Eighth Air Force have shared the task since D-Day. Before the day of assault, as you know, only one rail bridge and two road bridges over the Seine below Paris were still intact, and a start had been made in destroying the very numerous bridges over the Loire. Since then the offensive has continued, and bridges on the upper Seine, the Somme, Marne and Oise have been successfully attacked. Attacks on railway centres and junctions are still going on. As the work of previous weeks compels the enemy to route his trains by longer and more devious lines, other junctions and bridges have to be attacked, and all the time there is the ceaseless harrying by fighter-bombers of the trains and locomotives; the constant task of line-cutting by light and medium bombers.

Walking to War

Bad weather has made it difficult for us, yet much has been achieved. German divisions are known to have detrained as far east as Mulhouse, Nancy, and Bar-le-Duc, and have made the journey to Normandy by road; divisions have been moved by road from the Pas-de-Calais, using either a roundabout route through Paris or crossing the lower Seine by ferry. Divisions from Brittany and the Loire have had to cover the whole distance by bicycle or on foot, a proof both of disorganisation of the railways and lack of fuel, and M.T. divisions from the south of France are known to have taken 10 to 14 days to make a journey that should have taken 3 or 4 days only

In north and north-west France, where our fighter-bombers are active, all movement has become restricted to the few hours of darkness. In fact, there have been signs during the past few weeks that an incurable or at least chronic sickness has come over the French transport system, and the accumulative results of months of attack on the railway system are becoming apparent. In spite of enjoying a wide choice of routes on a dense railway network, the enemy has been hard pressed to find any way through for his badly needed reinforcements. *It has been estimated that the average overall rate of travel of German divisions moved since D-Day has been of the order of 25 to 35 miles a day.*

Divisions have arrived in the battle area piecemeal, tired, disorganised. They have often arrived either in no condition to be committed immediately to the battle, or in so disorganised a state that specialised troops, for lack of their equipment or special support, have been committed to fight as ordinary infantry. All this gained by our long-term policy of continuous attrition of the enemy's communication facilities.

The more obvious and spectacular aspect of air support in this invasion has been the close support given to the armies in the field, in which strategical bombers have on occasion been used as a weapon in the tactical development of a battle. In the period before the actual invasion, close support was given in preparation for the battle in attacking enemy battery positions and his radiolocation systems along the north coast of France. Both heavy and medium bombers attacked the batteries, while the radiolocation system was dealt with by fighter-bombers. These targets were very hard to find and very well defended, and cost us many first-class pilots, but there is no doubt that the fine work done by these pilots in eliminating the enemy radiolocation system was a major factor in obtaining surprise when the invasion was actually launched. In the assault itself, the whole bomber force was used to attack battery positions and beach defences to assist our troops in the landings. This effort was seriously interfered with by low cloud, but nevertheless it constituted a considerable contribution to the final assault. Since the assault took place, close support has been mainly provided by fighter-bombers.

Train movements in the battle area enclosed by the Seine and the Loire practically ceased within three days after the battle started I say practically, because in the long periods of recent bad weather the Germans have been enabled to carry out repairs and get a certain number of trains through, which would have been quite impossible if we had been able to carry out continuous operations. As the battle stabilised, some of the fighter-bombers were kept close in the battle area, dealing with enemy tanks and forward movements, frequently silencing batteries during the progress of an attack. There was a period for some weeks when there was very little movement on the immediate front of the capital armies; these fighter-bombers were then employed farther afield on the enemy's communications.

Low-level attack has had a shattering effect on armoured forces. During July alone, Allied pilots knocked out over 400 tanks and heavy armoured fighting vehicles, and that total does not take into account either probables, damaged targets, or attacks where results could not be observed. In the Caen battle on June 18th, a squadron of R.A.F. Typhoons sent up to deal with a packet of enemy tanks attacked with rocket projectiles, and very quickly disposed of 16 out of the 18 tanks seen, leaving them in flames. In the swiftly moving battle in the west, fighter-bombers have been working in the closest co-operation with advancing tanks, flying over our armoured columns warning them of hidden dangers and disposing of tanks and guns and machine-gun nests with cannon-fire and rocket projectiles. It can be realised that these low-level attacks demand the greatest dash, skill and courage, and cannot be undertaken without loss.

The losses inflicted on the enemy have been tremendous. In a single day the Ninth Air Force claim to have destroyed 147 enemy tanks, besides another 47 probably destroyed and a great number of vehicles of every kind. The fighter-bomber is a splendid weapon for exploiting a victory, and when the enemy begins to fall back all along the line it is a weapon which we intend to use to the utmost. *We shall give him no rest, and will see to it that he finds it fully as hard to withdraw his troops from Normandy as he did to get them there.* The amount of destruction caused daily by the Ninth Air Force and Second Tactical Air Force cannot be exactly estimated but it is certainly very great indeed, as no less than 3,083 M.T. vehicles were claimed as definitely destroyed by our pilots in the month of July, as well as countless others probably destroyed and damaged.

Apart from the various classes of fighters, the Tactical Air Forces also have medium and light bombers, and these have been employed mainly against the enemy's rail communications and against his dumps within the area outlined by the Seine and the Loire. They have also been especially successful in creating railway blocks at vital points. At night our Mosquitoes roam far and wide over the road and railway communications and have achieved most satisfactory results, many ammunition trains having been blown up and petrol trains completely destroyed by fire.

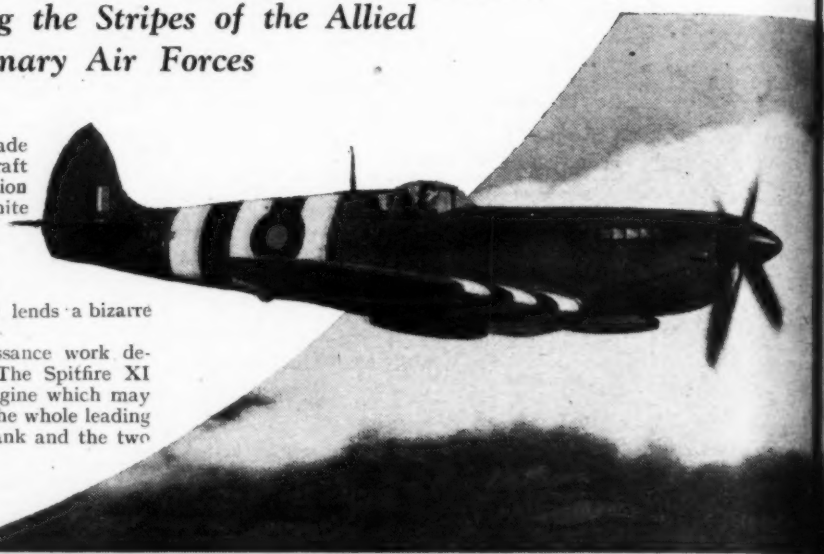
Close Support "Heavies".

There is another type of close support which is something of a novelty, and that is the employment of heavy bombers to assist the army when the situation has become stabilised, and the enemy defences have become well-nigh impenetrable. *The fact that it has been possible to employ heavy bombers effectively to break the crust of the enemy defences has been due to the fact that the accuracy of bombing has increased out of all recognition during the last year,* which means that it is possible to lay down very heavy concentrations of bombs on the strongest points of the enemy defences. These, where cratering is acceptable, can completely wipe out a strongpoint, and in cases where cratering would impede the movement of our troops, a carpet of bombs with instantaneous fuses can be laid which disrupts the enemy's defences and has a very shattering effect on his morale. This technique has been employed on few occasions up to the present. The best example, perhaps, was the battle of Caen on July 18th, when all classes of bombers took part. The crust in that part of the front was particularly thick, and it frustrated our efforts to get through for several weeks A tremendous concentration of bombs was put on to the strongpoints and battery areas in the forward area, to a depth of some five miles. This bombardment was immediately followed by an attack of tanks and infantry, who made a rapid penetration to the depth up to which the bombing had taken place. Although the technique on occasions has not been perfect, and the operations constitute a new enterprise for the heavy bombers, nevertheless, each time a heavy bombardment of this nature has been used our armies have been able to carry out a swift advance. This is an important factor in the development of our technique, but I would have you remember that the heavy bombers have many other important functions to fulfil. It is a striking example of the flexibility of our air power that one day they can be helping our armies on the battlefield and the next day they can be striking at the heart of Germany.

D

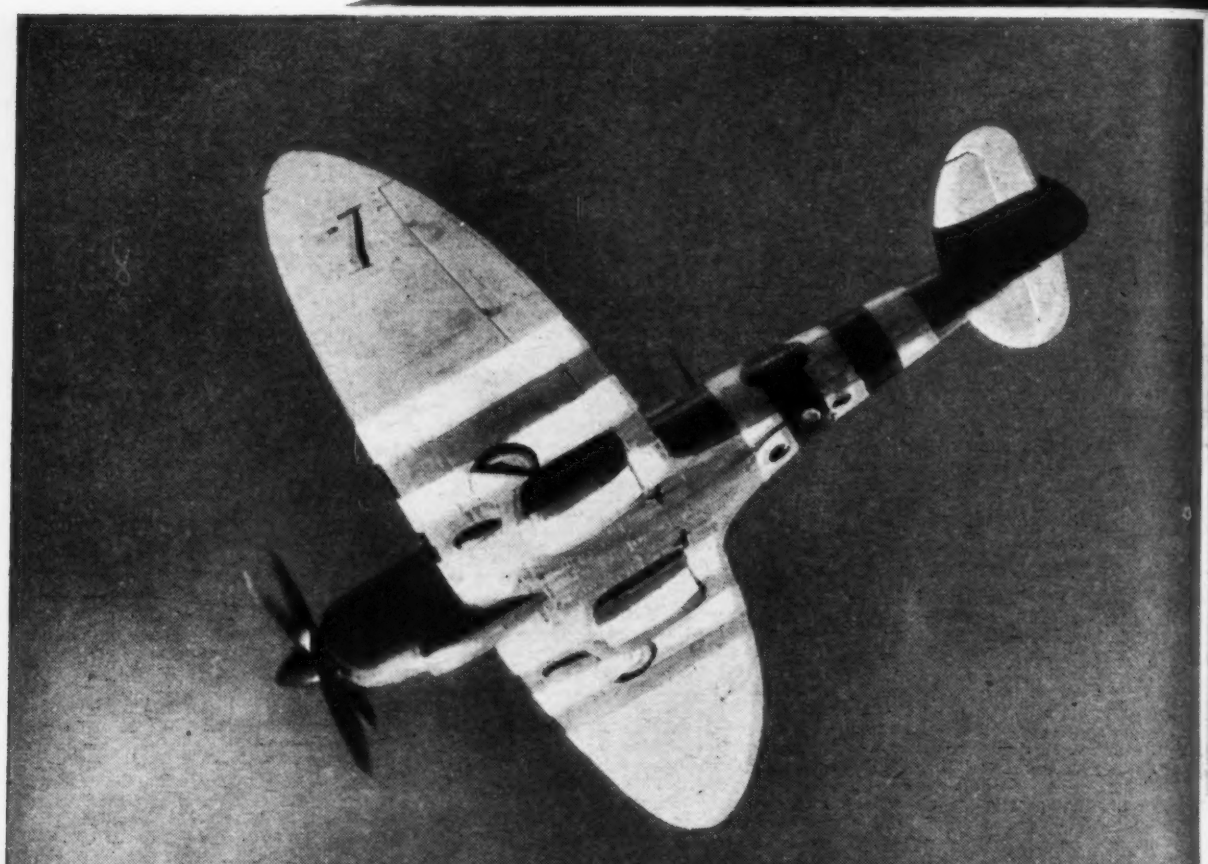
For Photographic Recce.

New Pictures of the Vickers-Armstrongs Supermarine Spitfire XI Wearing the Stripes of the Allied Expeditionary Air Forces

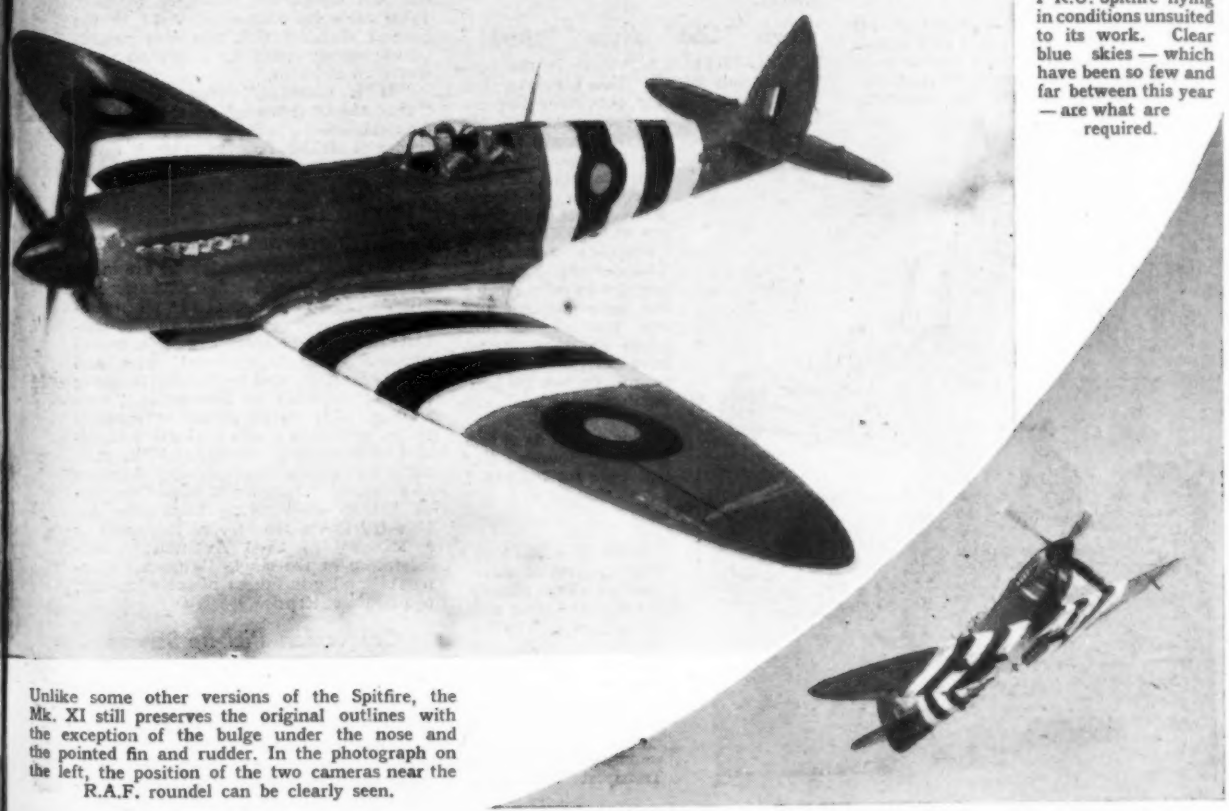


IN order that no mistake should be made between friendly and hostile aircraft during the early stages of the invasion it was decided to paint black-and-white stripes on all Allied aircraft taking part. Despite the fact that Spitfires of P.R.U.s earn their living mostly at 30,000ft., these were included in the scheme. The new painting certainly lends a bizarre touch.

Much of the photographic reconnaissance work demands high speed and long range. The Spitfire XI has a 1,650 h.p. Rolls-Royce Merlin engine which may be either Mk. 61, 63, or 63A. Nearly the whole leading edge of the wing is a long-range fuel tank and the two main tanks are carried in the fuselage.



These two photographs show the P R.U. Spitfire flying in conditions unsuited to its work. Clear blue skies — which have been so few and far between this year — are what are required.



Unlike some other versions of the Spitfire, the Mk. XI still preserves the original outlines with the exception of the bulge under the nose and the pointed fin and rudder. In the photograph on the left, the position of the two cameras near the R.A.F. roundel can be clearly seen.

HERE AND THERE

Inventor's Claim

MR. ADAM CRAIGON, a Toronto inventor, claims to have the answer to the air torpedo and has cabled Mr. Churchill offering his services.

Yet Another

NEWS has just been released that some Spitfires now carry three bombs—two 250-pounders under the wings and a 500-pounder under the fuselage. The machine-guns have also been changed from four 0.303in. to two 0.5in guns, thus effecting a saving in weight.

Motor Merger

WYNDHAM HEWITT, LTD., a company formed by Lagonda Motors, Ltd., in 1936 primarily to undertake Government contracts, is now to be merged into the parent concern, and the single company will in future be known as Lagonda, Ltd.

Gyro Gun-sight Mk.11D

JUST as we go to press, it is revealed by M.A.P. that the efficiency of our fighter aircraft in the ratio of kills to combats has been almost doubled during the past six months by the introduction of the Gyro Gun-sight, Mark 11D.

This British development is a complex system of electrical units which enables the pilot to open effective fire at over 400 m.p.h., over 400 yards range, and at wide angles of deflection previously considered impracticable.

But in contrast to its constructional complexity, this gun-sight is very simple to use, for the pilot merely sets an indicator to the type of aircraft he is attacking (adjustment for span) and by means of a twist-grip on his throttle lever, sets the range. Deflection is taken care of by the automatic movement of the aiming graticule on the reflector.

Death of "Rusty" Hall

WE very much regret to record the death of John Selby Hall, one of the Rotol test pilots, in a recent flying accident.

The 34-year-old bachelor son of Admiral S. S. Hall, C.B. (ret.), "Rusty" Hall, as he was popularly called, was an old Imperial Airways pilot on the Durban route. He joined Rotol, Ltd., in March, 1940, and had a fine record as a test pilot.

Modernity at Mexico

THE new airport at Mexico City will, when completed, boast five main runways ranging in length from 5,740ft. to 8,200ft. and several smaller ones.

Its passenger terminal will, it is reported, be capable of accommodating 1,800 persons at one time, and the area of the field will be almost twice that of the La Guardia airport, New York.

Another Super-Bomber

A NEW heavy bomber, said to be comparable to the Boeing B-29 Superfortress, is now being produced by Consolidated Vultee at their San Diego factory. The designation of the new aircraft is B-32, but censorship forbids the publication of any further details at present.

Fewer "Libs," More "Supers"

SUBSTANTIAL reduction in the production of the B-24 Liberator has been ordered by the U.S. War Department to make way for quantity production of the B-29 Superfortress and the new Consolidated B-32 mentioned above. Cuts in the output of C-36 Commando transports and P-47 Thunderbolt fighters are also to be made for the same purpose, and are possible because losses in these types have been far less than expected when the production schedule was set.

This accent on superbombers sounds like bad news for the Japs!

GOING UP! The high loading level of some modern cargo planes, notably low-wing tricycle types such as the Skymaster, calls for special handling equipment to ensure ease and speed. This Clark "fork truck" is a typical example of some now used by Transport Command.

The B-40 Flak-cruiser?

THE announcement of a Boeing B-40 which carries no bombs but is armed with a total of 30 guns—twenty-eight 0.5in. machine guns and two cannon—is made in a recent issue of the German periodical *Flugsport*.

This aircraft, says the journal, is nicknamed a flak-cruiser, and it goes on to enumerate the disposition of its abnormally heavy armament. Summarised, there are six m.g.s in the nose, six in two dorsal turrets, eight in two ventral positions, and four in the tail turret. At each waist position there are three m.g.s and a 20 mm. cannon.

Anticipated in 1940

SUCH an aircraft as the above would obviously be meant for long-range escort duties, and in *Flight* of January 11th, 1940, there was published an article on "The Problem of Escort Fighters," in which a heavily armed escort fighter "closely related to a bomber" was one of a number of possible types proposed.

Incidentally, this article contained a close-up picture of a Boulton Paul Defiant reproduced from the German journal *Luftwehr*, and plainly showing the four-gun arrangement then an official secret in Britain.

Lamplugh Committee Report

THE second report of the Lamplugh Committee which has just been issued (its first report was published in May, 1943) adds its considered voice to the general demand that the Government should openly state its policy on post-war civil aviation.

"It is essential," says the report, "that the Government should declare a comprehensive policy concerning the future of British international air transport. Any further delay is likely to be detrimental to the structure of the Empire."

Recommendations

FIVE main recommendations are made which may be briefly summarised as follows: Establishment of an international governmental authority to control aircraft and airport standards, ensure uniformity in navigational rules and similar matters, and to exercise licensing powers; establish an international controlling body of operators to regulate traffic regionally; international recognition of freedom of transit, facilities and, subject to regulation, reasonable freedom of commerce; transfer of administration of British civil flying from the Air Ministry to the Ministry of Transport or a Ministry of Civil Aviation; reconsideration of the single "chosen instrument" policy in favour of one admitting of private enterprise.

Californian Pick-up Service

APPLICATION to operate six feeder and pick-up airline routes radiating from Los Angeles and San Francisco has been filed with C.A.B. by the Ryan School of Aeronautics at San Diego. If granted, these routes will, it is stated, place on the American air map more

PASSED FOR UNRESTRICTED SERVICE USE

The PHILIDAS
Self Locking **NUT**

PHILIDAS LTD···THE AERODROME · READING

WHEREVER MEN FLY

Reid & Sigrist

FINE PRECISION INSTRUMENTS

REID & SIGRIST LTD., SHANNON CORNER, KINGSTON BY-PASS, NEW MALDEN

HERE AND THERE

than 100 Californian cities not previously served by air transport facilities.

Additionally, Ryan has also applied for two foreign air routes, one from the West Coast across the Pacific to Asia, and another through the south-western states to Cuba.

Self-sealing Cabin

A SHATTER-RESISTANT plastic which self-seals bullet and *flak* holes is being used in the construction of the pressure cabin of the Boeing B-29, it was recently announced by du Pont de Nemours and Co., the American firm responsible for its development.

The material is described as a three-ply, transparent plastic of laminated bucite-butacite produced by a specially developed process.

South African Conference

THE agenda for the South African air conference, which will probably be held in Johannesburg some time during October, is now being prepared.

British territories in East, Central and Southern Africa, as well as the United Kingdom, are being invited to send representatives.

Australian Epic

MR. HUDSON FYSH, of Qantas Empire Airways, has described as "one of the epics of air transport of the war," the maintenance for more than a year of a regular non-stop service from Australia to India which links up with air services to Great Britain.

It was started in July last year—weekly at first and then more frequently—at the wish of the British Government, in collaboration with the Australian Government, in order to speed up air communications between England, the Middle East, India and the Commonwealth. The average time for the flight across 3,500 miles of the Indian Ocean is 27hr.

To Advise the Shippers

MAJOR R. H. MAYO, designer of the Short-Mayo composite aircraft, has been appointed air technical advisor to Shipping Airlines, Ltd., the concern recently formed by 40 shipping companies which form one of the five groups of shipowners interesting themselves in air transport with particular reference to post-war development.

The company proposes to operate air services between Great Britain and the European Continent, and is preparing a scheme for submission to the Government as soon as possible.

The Kingcobra

THE U.S. War Department has announced that the P-63 Kingcobra—virtually a development of the P-39 Airacobra—is now in action.

Fitted with the more recent type of Allison engine, having a two-stage two-speed supercharger, and a low-drag "laminar flow" wing (span 38ft.), the top speed is quoted as being "close to 400 m.p.h." and the service ceiling as "about 35,000ft.," while its armament is described as "substantially the same as the P-39."

Its combat potentialities, therefore, though a distinct improvement on those of the P-39, are nothing startling judged by present-day standards, but a 50 per cent. increase in operating range should prove a very useful asset.

Fun and Games!

MAYBE the writer of these notes has a distorted sense of humour, but he has to admit that the way local authorities in various parts of the country are pushing forward their schemes for THE Transatlantic Air Terminal is causing him a certain amount of amusement.

What provokes the malicious chuckles

is that every contestant puts forward an "unanswerable" argument to prove that *its* site is obviously the best for such an important airport.

The Rivals

PRESTWICK is almost shocked that anyone should suggest a site near London; Southampton, with an anxious eye on Portsmouth's scheme, hastens to point out that *its* site can look after both seaports, while up along the Lancashire coast almost every seaside place from the Mersey to Morecambe Bay is clamouring to have THE airport. There must be money in this flying business after all!

Then, in contrast with all this feverish enthusiasm, the "residential" Lytham-St. Annes, apparently with no greater liking for aircraft than it has for London evacuees, has decided to oppose the airport scheme of its neighbour, Blackpool, "to the last ditch," according to a recent Press report.

Airmindedness—

IT may be claimed that the above-mentioned eagerness to establish super-airports shows a highly commendable airmindedness on the part of the towns concerned. But surely it all depends what you mean by airmindedness, as Dr. Joad would undoubtedly say.

If you believe that the "City Fathers" of the towns concerned are motivated solely, or even mainly, by an enthusiasm for the cause of aviation and a love of flying for its own sake, then the writer would agree that it was airmindedness.

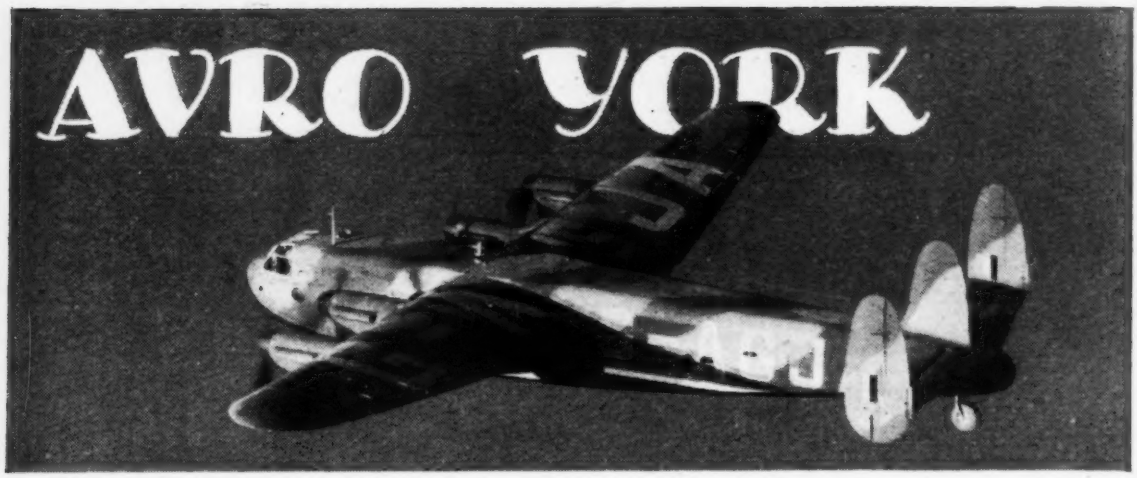
Or Just Business?

BUT supposing they are interested mainly in filling the local coffers out of aviation and merely see, in the possession of a Transatlantic Air Terminal, yet another means of bringing money into the town—a modern development to be exploited for financial profit? Can that be called airmindedness?

If any or all of these townships are honestly anxious for Great Britain (as distinct from Puddlecombe-on-Sea) to have the post-war advantage of one or more Transatlantic Air Terminals, they will get together and arrange for some disinterested authority on the subject to decide which are the best sites, and stop this undignified scrambling after potential plums.

THEY DON'T BOUNCE: This is not some new ball game, but a party of South Coast A.A. gunners taking charge of one of the wire-bound spherical compressed air bottles retrieved more or less whole from an air torpedo they have shot down.

AVRO YORK



Some Impressions and a General Review of Britain's Latest Civil Aircraft

TO many people—almost everyone in fact—the York is held to be Britain's first post-war civil aircraft. That it is a stop-gap, at best a wartime compromise, seems to be generally overlooked, and although the York is a first-class aircraft and Avro's have done a very fine job, the machine was neither conceived nor designed as a *commercial* aircraft to be operated within the limits of economic tenability. The primary reason for the York's existence was the vital necessity of providing a reliable, easily-produced aircraft with good range and payload to take care of the transport requirements of the various branches of the Government and the fighting services. A further necessity was and is, that production of this aircraft should interfere in no way with the production of military aircraft. It is an amazing thing, but Avro's can have no one working officially on the York—the machine is not a designated type and, despite the fact that the firm are being urged to produce more and more Yorks for official use, production has to be made in a "hole-and-corner" fashion in odds and snippets, as no labour of any description can be made officially available for the work.*

By contrast, our American allies are producing modern commercial types as hard as they can go, and any men working on these are exempt from military service automatically. A situation which makes one think.

However, to return to the York; most of our readers will be generally familiar with the aircraft, as articles on the freighter version (*Flight*, Jan. 20th, 1944) and illustrations of the passenger version interior (*Flight*, June 29th, 1944) have appeared. The wings, engine nacelles and undercarriage, and the tailplane, fins and rudders are standard Lancaster components; but the entirely new fuselage, the setting of the wing and the addition of a central tail fin make the York a completely different aircraft from its martial brother.

The decision to employ Lancaster parts wherever they could be used made production of the York possible with only 9,000 jigs and tools instead of about 30,000, the number which would be needed for a wholly new machine. Additionally, the production time in terms of man-hours is lessened, and so is the prime cost.

Construction is largely pre-fabricated in sub-assemblies, and assembly proceeds in major sections throughout the length of the fuselage, which is divided, for production, into five main parts:—nose, main front, centre-section, main rear, and tail. The pre-fabricated sub-assembly type of production is a great factor towards simplicity—and were the York a more difficult aircraft to build, one imagines

* Since this note was written, Capt. Balfour has announced some relaxation in connection with civil aircraft.—Ed.]

This view of the York shows the low ground clearance which allows a normal undercarriage to be used despite the high wing position. Note the navigator's side blister behind the second pilot's window. The radio mast does *not* project through the astrodome, as may be verified from the heading illustration.

DOUBLE-PURPOSE, and better at each

Timken tapered roller bearings carry heavy radial loads, heavy thrust loads, or a combination of both.

Whichever duty they are performing, they are better at it because of their generous line contact and perfect rolling action.

These inherent features permit an improved performance and in many instances a simplification in design.

BRITISH TIMKEN LTD., BIRMINGHAM, 7

Telephone: East 1321 Telegrams: 'Britimken, Birmingham.'
Associated Company: Fischer Bearings Co., Ltd., Wolverhampton
makers of F.B.C. ball & roller bearings and transmission equipment

Registered Trade Mark Timken

TIMKEN
tapered roller bearings

AVRO YORK

something might be done officially about the labour position—it having become Avro's policy to design aircraft from the very start with every regard for production methods and limitations (which explains the fact that the time required to build a Lancaster is very much less than that required for any other aircraft of similar size and type).

Starting from the nose of the York and working aft one is immediately struck by a most ingenious feature. This is the extreme nose fairing which is hinged at the top to open and thus to give access to the rear of the pilots' instrument panel.

All wiring for the panel is made up in looms, or individual sets, so that time need not be wasted in searching for a defect, the faulty length being extracted and a new length put in place. Plumbing which serves non-electric instruments is carried up at the side of the access panel, and all unions are staggered to facilitate spannering. A seat is provided for personnel working on or inspecting the services, and this is an excellent feature as the nose is about seven feet from the ground and access would normally be, without the provision of the seat, scarcely conducive to thorough work. Two overhead lights are also incorporated and these are well placed to illuminate the whole of the nose interior.

Control Quarters

The pilots' rudder pedals are individually suspended from double torque tubes, both right pedals being on one tube, and both left pedals on the other, whilst easy access to the bearings carrying the tubes is provided by external blisters which cover the bearing assemblies on each side of the nose. Rudder pedals are adjustable for length of leg, the range of adjustment being about four inches.

Layout of the crew quarters is pretty good (one can hardly refer to an "apartment" like this as a cockpit) but it is difficult to see a really good reason why the wireless operator should sit about four feet below the level of the navigator and pilots—it would seem that the crew could all have been accommodated on much of a level without too much design inconvenience—however, the point is not of great importance.

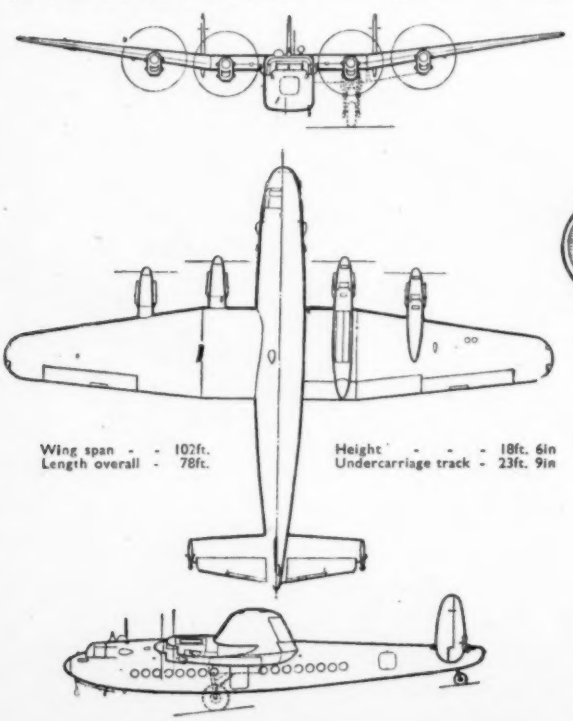
The instrument panel is well devised, and each of the pilots has his own blind-flying panel. Engine and ancillary instruments are grouped centrally between the flying instruments, and the duties of a flight engineer are carried out by the second pilot. Trim controls are mounted together in a box on the right side of the chief pilot's seat, where they are accessible to both men, and, an important point this, the trim control wheels are each positioned in a similar plane to the *action* they control, viz., the elevator trim wheel rotates on a'thwartships axis, the aileron trim wheel on a longitudinal fore and aft axis, and the rudder trim on a vertical axis.

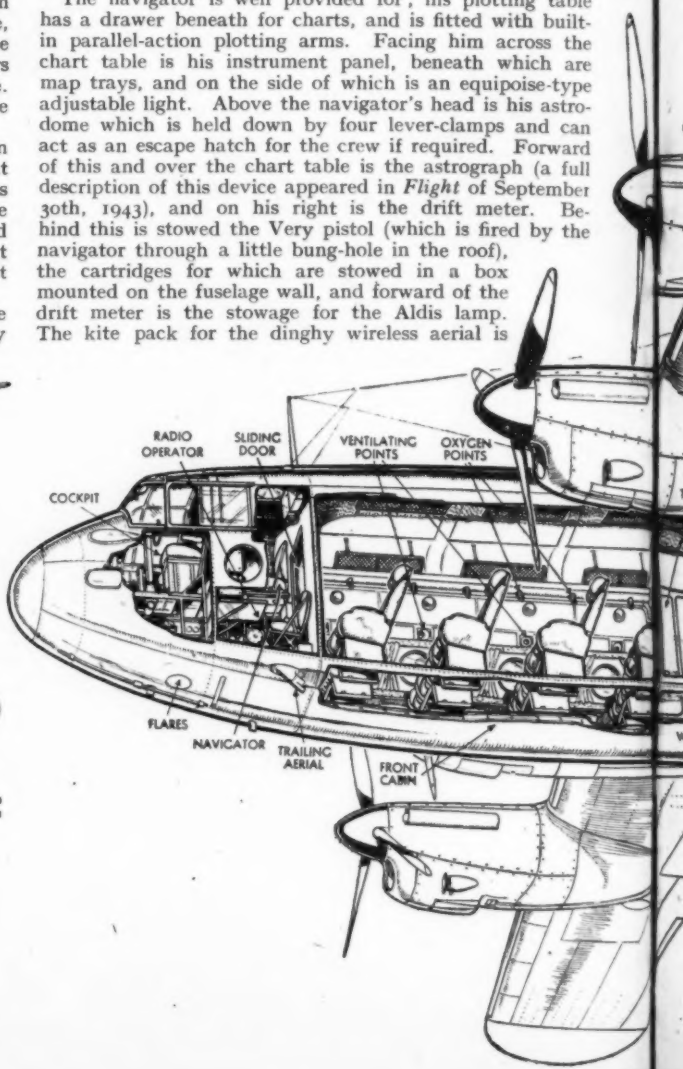
Sun Blinds and Blackout

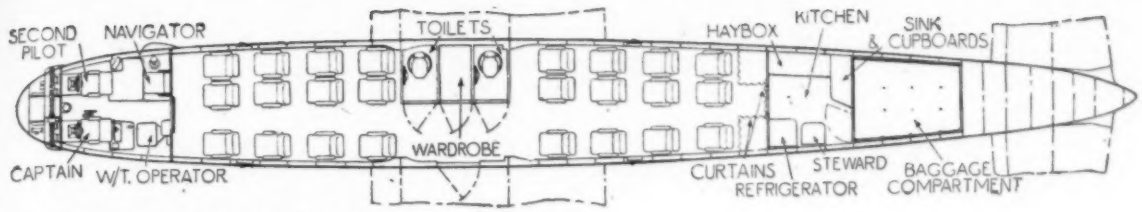
Throttles, airscrew pitch controls, boost cut-out, carburettor hot and cold air, undercarriage and flap controls are all mounted in the roof between the pilots, where they are readily accessible to each and do not obstruct the reading of instruments.

The field of view from the pilots' seats is truly excellent; there is the minimum of obstruction and no blind spots in vital sectors. Twin nozzles protrude through the top of the nose cowling and direct a spray of ethylene glycol on to the front screens to prevent ice formation. The glycol is fed from a tank forward of the instrument panel, by a hand pump operated by the second pilot. A refinement which pilots should appreciate is the provision of thin fabric sun-blinds overhead, which can be pulled forward and attached at the top of the front screen; blackout curtains are also fitted behind the "drivers'" seats and, of course, to the radio operator's and navigator's window, side blister and astro-dome.

The navigator is well provided for; his plotting table has a drawer beneath for charts, and is fitted with built-in parallel-action plotting arms. Facing him across the chart table is his instrument panel, beneath which are map trays, and on the side of which is an equipoise-type adjustable light. Above the navigator's head is his astro-dome which is held down by four lever-clamps and can act as an escape hatch for the crew if required. Forward of this and over the chart table is the astrograph (a full description of this device appeared in *Flight* of September 30th, 1943), and on his right is the drift meter. Behind this is stowed the Very pistol (which is fired by the navigator through a little bung-hole in the roof), the cartridges for which are stowed in a box mounted on the fuselage wall, and forward of the drift meter is the stowage for the Aldis lamp. The kite pack for the dinghy wireless aerial is





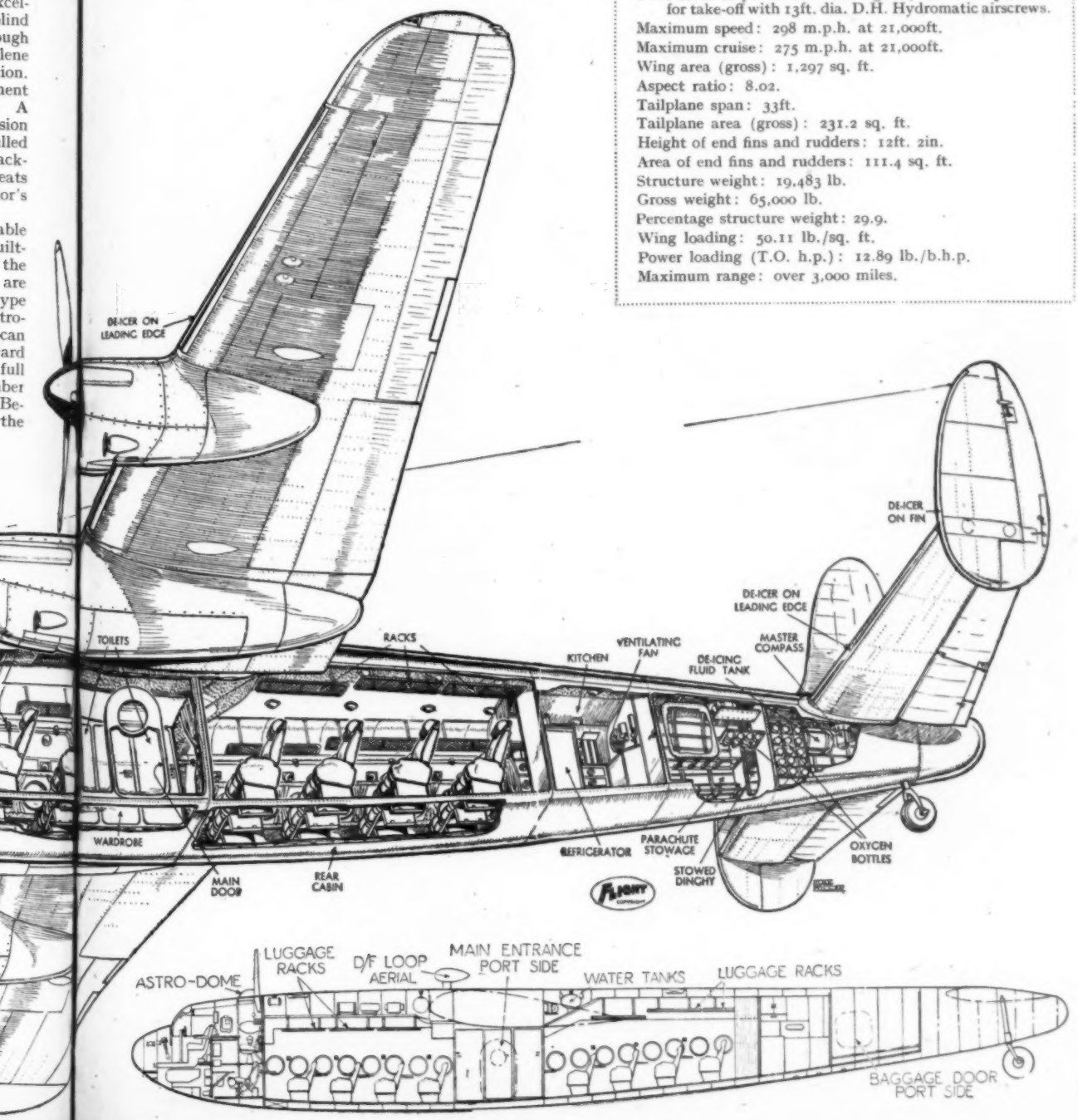


secured to the bulkhead behind the navigator and to his right.

In the York the radio operator has similar equipment to that used in the Lancaster, some of it being mounted above his table and some on his right beneath the navigator's table. The standard blind-approach beam receiver

AVRO YORK DATA

Four Rolls-Royce Merlin XX engines, 1,260 b.h.p., each for take-off with 13ft. dia. D.H. Hydromatic airscrews.
Maximum speed: 298 m.p.h. at 21,000ft.
Maximum cruise: 275 m.p.h. at 21,000ft.
Wing area (gross): 1,297 sq. ft.
Aspect ratio: 8.02.
Tailplane span: 33ft.
Tailplane area (gross): 231.2 sq. ft.
Height of end fins and rudders: 12ft. 2in.
Area of end fins and rudders: 111.4 sq. ft.
Structure weight: 19,483 lb.
Gross weight: 65,000 lb.
Percentage structure weight: 29.9.
Wing loading: 50.11 lb./sq. ft.
Power loading (T.O. h.p.): 12.89 lb./b.h.p.
Maximum range: over 3,000 miles.



The
HELIX ASPERSA—
or to you and me the common snail—is a strange craft. On moist warm days it may be observed noiselessly gliding through the long grass round the edges of airfields. A very wise creature, never having been known to venture forth without its own exclusive form of weather protection—its portable hangar.

Contrast this superlative comfort with the first Spitfires to touch down in Normandy . . . only emergency landing strips on the beaches and such luxuries as hangars were good material for the funny stories of those early, anxious days . . . the weather was simply shocking but those Spitfires had to be kept in constant fighting trim ready for instant and deadly perfect action.

Weather protection under such conditions was a most vital problem . . . in fact a problem very suitable for those Healthguard people at Leicester . . .

HEALTHGUARD

AEROQUIPMENT

MANUFACTURERS OF AIRBORNE AND GROUND EQUIPMENT FOR ALL TYPES OF AIRCRAFT, PARACHUTES AND BUOYANCY CLOTHING.

AVRO YORK

unit is on the fuselage wall behind the chief pilot's head.

The flight controls themselves are similar to those on the Lancaster, and the "feel" of them, in flight, is also very similar. Roy Chadwick is probably the most "control-conscious" designer of aircraft in the world, and his earnest belief in giving pilots the most perfectly balanced controls possible must account largely for the wonderful success of Avro machines. Certainly the York is as delightful to handle as one could wish, the response and absolute dead-beat positiveness of aileron, elevator and rudder being something quite out of the ordinary. A great deal of this excellence is undoubtedly due to the carefully apportioned control trimming and the insistence of the Avro test pilots on having every machine "control perfect" ere it leaves their hands.

The "super-important personage" version has leather individual armchairs which can be swivelled round to facilitate conversation.

Rear cabin in a super-I.P. York. The chairs can be extended and allow passengers to recline full length.

Access between the crew compartment and the front passenger cabin is by means of a sliding door, in the centre of which is a ventilating fan. The cabin interior layout and the decoration and furnishing are dependent upon the individual requirements for which the machine is to be used. Passenger classification is on an ascending scale as follows: 1st class passengers, junior important personages, very important personages,

A corner of the kitchen, showing the haybox with crockery cabinets above, and (right) the sink and urn, and extractor fan blanking cover.

The central wardrobe, showing coat hooks and rail for hangers; and the rear toilet room. The folding wash-basin is behind the projecting panel on the wardrobe/toilet room wall.

AVRO YORK

and super-important personages. There is no *standard* passenger version of the York as such, although in view of the fact that there are more Yorks of the 1st class passenger category than of any other (including freighter versions), this class can be nominally represented as standard, and it is with this type that we shall deal.

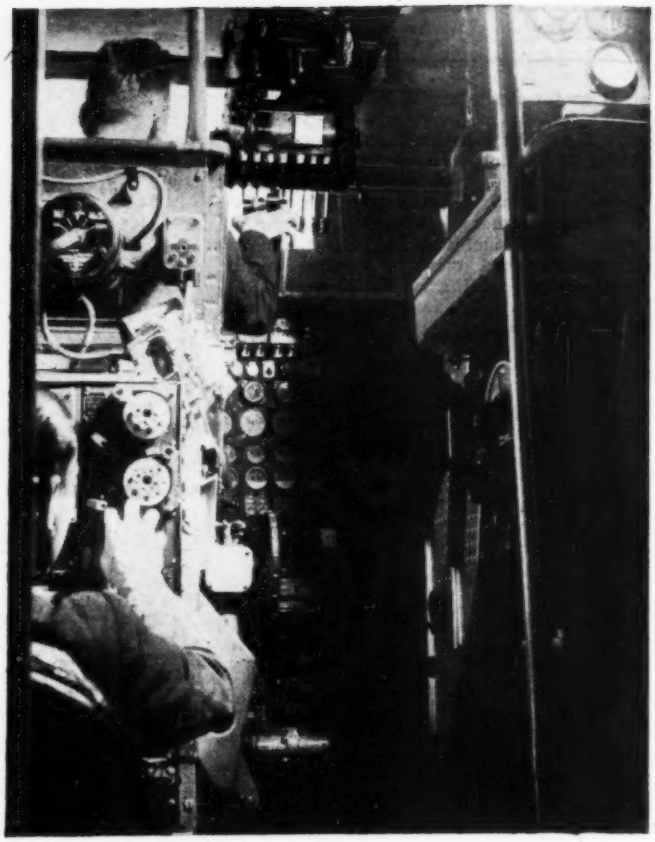
Twenty-four passengers are accommodated in two cabins, twelve in each, the compartments being divided by the wardrobe space and toilet rooms, which are placed to starboard of the entrance "hall." The seating arrangement provides each passenger with an individual armchair, but these are arranged two side-by-side to starboard, and singly to port, leaving a gangway or aisle the whole length of both cabins. The seats are positioned so that each "row" is served on each side by two of the circular windows which pierce the length of the fuselage, and this ensures the cabin being pleasantly lighted without the attendant design difficulty of large unstressed areas.

Cabin Ventilation

The ceiling of the front cabin is false, being made up in three detachable panels which give access to the interior of the roof proper. In the space provided by this false ceiling are a folding ladder stowed athwartships and serving a ditching escape-hatch in the roof to starboard forward (a parachute escape hatch is to port forward in the floor); a water tank which serves the toilet rooms, the electrical system batteries, which are stowed to starboard; and the hydraulic system components, which are mounted on a panel on the forward face of the front main spar.

Above the seats are racks for light luggage, and above the racks are ducts for infiltration ventilation of cool air. Ducts for infiltration of warm air are above the cove skirting between walls and floor, the degree of warm and cool air supplied to the cabin being regulated by handles controlling butterfly flaps at the rear end of each duct. The warm air duct is supplied through radiators fed from both inboard engine coolant systems. Cold air is taken in through a vent in the wing-root leading-edge, passes through a radiator in which circulates coolant from the adjacent engine, and is there warmed and fed to the cabin duct, which also feeds the crew cabin. Cool air is supplied from small single scoops on each side of front and rear cabins. The crew compartment has a vacuum extractor vent, and cool air has to flow forward from the passenger cabin aided by the fan in the communicating door. In addition to the general cabin ventilation described, each passenger has an adjustable fitting by which a stream of warm or cool air of controllable strength can be played where desired.

The central space between the passenger cabins is devoted to toilet accommodation, and a central wardrobe fitted with hooks and rail for coat hangers. Each toilet room has a special Elsan flushing closet, a light-alloy folding wash basin, and a wall mirror. The outer walls and doors of the toilet rooms are of stretched leather, enamel painted, whilst the inner walls are doped and enamel painted fabric.

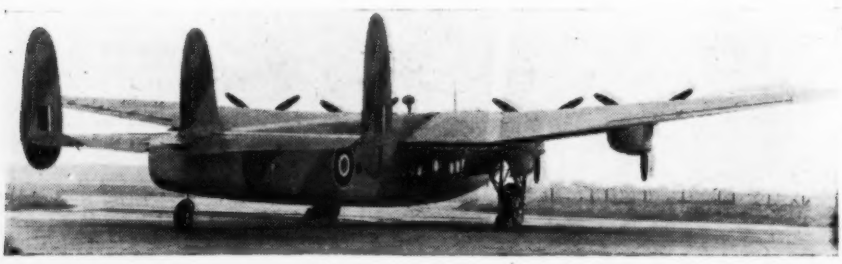


The "office" seen through the entry door. The pilot's hand is on the throttles, beneath his elbow are the engine instruments. The radio man is at bottom left, and a portion of the navigator's panel is at top right.

Kitchen Equipment

Layout and general arrangement of the rear passenger cabin is similar to the forward cabin, but there are minor differences, such as the arrangement of lights which, in the rear cabin are placed in the roof, whereas in the front cabin they are in the walls. This is made possible by not having a false ceiling in the rear cabin except at its forward end where a raking panel encloses hot- and cold-water tanks for kitchen services, the hot water being obtained by means of an immersion heater.

Aft of the rear cabin is the kitchen, and very well equipped and arranged it is. Food is not cooked aboard, but an elaborate "hay-box" type of electrically heated cabinet maintains pre-cooked food piping hot without allowing it to become dry and "stale." The haybox is to starboard with the heating control panel on top. Over the haybox, fitted



The clean main-plane top surface, two-part wing flaps, neat tail-unit, and twin-tread tail-wheel can clearly be seen in this view.

against the wall, are ship-type cabinets and crockery racks which hold their contents secure even during violent motion. Running athwartships against the rear wall is the stainless steel sink and draining board, the sink being served by press-down-lever type taps. Over the draining board is a flap serving a refuse chute to a bin on the rear side of the wall, and above the chute is an extractor fan. Above the sink is mounted an urn for boiling water, and to port of it is a "Metafilter" filter for producing drinking water. To port, forward, is the refrigerator, aft of which is a folding and very comfortable rest chair for the steward.

Access between kitchen and the luggage compartment aft is by a doorway, on the starboard side of which is a general-purpose folding ladder (which can give access to the after ditching hatch in the roof of the rear cabin) and also the main entry ladder. Each of these ladders is made of light alloy tube, the main entry ladder having a hand-rail and flat, folding treads for greater ease of use.

Oxygen System

A loading hatch about three feet square is in the port fuselage wall, and baggage is disposed to starboard on racks fitted with lashing straps. On each side, aft, are racks for three valise-pack dinghies which supplement the dinghy carried in the wing. Dip-sticks for fuel tanks are stowed in clips on the starboard wall. In the rear wall of the baggage compartment a doorway gives access to space aft in which are disposed the de-icing fluid reservoir, on the starboard wall, and beneath it the electric pump for wing and tail unit de-icing. Against the rear bulkhead is a box rack for general maintenance equipment, viz., engine covers, wheel covers, etc., and above this is suspended the D.R. master compass.

On each side of the doorway in the forward wall is mounted a crate, each crate containing 15 oxygen bottles. These are standard fittings and, with a further crate of 15 bottles housed beneath the navigator's floor in the crew compartment, provide the main supply of oxygen for every person aboard. The supply of oxygen is made available to each cabin through the standard type of reducing and metering device that is used throughout the R.A.F., but the crew have their own control which is quite separate from the passengers'. In addition to the main oxygen system, which serves each passenger through individual plug-in points at each seat station, a series of portable bottles is carried to enable the steward and flight crew to move about, or, if required, is available for passengers also. Oxygen plugs are fitted in each toilet room, but not in the wardrobe. Oxygen masks and Mae Wests are carried in small bags fitted beneath each passenger chair.

Interior Finish

The interior of the passenger cabins is lined in leather, behind which is a cellular sound-proofing composition, rather like a soft spongy cardboard, stuck with Bostick to the metal fuselage skin in the interstices of stringers and formers. The floors are covered with linoleum which in turn is covered by fitted carpets. Despite the fact that it could, sometimes, look cold, the interior decoration of the York is very pleasing in its dual shades of grey and a smoky blue. Heavy curtains can be drawn across the circular windows effectively to black them out, and the "night" effect, with curtains drawn and lights softly glowing, is very restful, providing an atmosphere of genuine luxury and ease of travel. The passenger accommodation is a result of close co-operation between Avro's and Rumbold.

Structurally the York fuselage is a simple, straightforward piece of work. As mentioned previously, construction is largely pre-fabricated, the skin being broken down into small panels, riveted in fixtures to the top-hat-section stringers which are in turn attached, also in fixtures, to the formers. Normal formers are of lipped-channel section, but members known as "transport" formers are placed where major fuselage sections are joined. The transport formers are L-section extruded components, and section is joined to section with high-tensile steel bolts. Ordinary lipped-channel formers run down to beams of similar but deeper section which, fitted with capping strips, support the fuselage floor. To provide increased torsional stiffness, four spine members of I-beam section run fore-and-aft beneath the floor. The floor proper is of multi-ply-wood and is secured to the transverse beams (at former stations) with screws and floating anchor nuts.

Wing Structure

The 102ft. span wing of the York (and Lancaster) has a rectangular centre-section plan with almost uniformly tapered outer panels, there being the most taper on the leading edge. The aerofoil is the standard N.A.C.A. 23000, the plan taper giving an 18 per cent. thickness/chord root ratio and a 9 per cent. thickness/chord tip ratio. Wing incidence is 4 deg., and outer panel dihedral 7 deg.

The centre-section structure is simple and sturdy, the front and rear spars of sheet web and channel flange construction being tied by Warren-girder type ribs. Both spars are similar, the solid sheet web having extruded channels bolted along top and bottom edges on the inside. These channels are attached to the spar web through their base so that the spar section proper would appear as a shallow channel with double sides. Spar construction is identical in the outer wing panels to that in the centre section, although naturally the spars taper towards the tip.

Ribs in the outer panels have pressed-sheet webs and L-section flanges, with vertical channel strips for stiffening, and between these stiffeners are flanged lightening holes. The centre-section leading edges are separate units, hinged along the top flange of the front spar in order to give access to the leads and equipment which are carried on the front face of the spar. For the rest of the wing, skinning is of the normal stressed type construction on stringers which are riveted to the ribs.

Control Balance and Response

Each aileron is fitted with a servo-trim tab and an adjustable balance tab, the range and response to trim being excellent, whilst the stick forces can be dismissed as purely nominal throughout full aileron travel even when operated to the full extent at high speed.

Apart from the addition of a central fin, the York tail unit is virtually the same as the Lancaster's. The central fin was found desirable on the York as a means of providing increased vertical area at the tail to compensate the large keel surface forward of the c.g. and so retain the same directional stability which is characteristic of the Lancaster. Actually, the central fin is slightly shorter than the outward fins and rudders, although the discrepancy is not readily apparent.

Rudder control is beautifully balanced and responsive, the proportioning of servo tabs and aerodynamic horn balances in relation to rudder area producing a hinge moment which is nearly constant over the whole range of movement. Rudder servo-tabs are at elevator level and are fitted with small mass balances on 6in. arms on each side. The aerodynamic horn balance on each rudder is at the bottom, but fair-sized mass balances are carried on 15in. arms about 2ft. below the top of the rudder on each side.

Elevators each have servo and balance tabs, and here again the control response and stick forces are all one could wish. Construction of the tailplane, fins and rudders is quite conventional, being the normal stressed-skin on stringers attached to pressed sheet ribs. The tailplane is similar in some respects to the wing, in that it is a two-spar structure with similar rib arrangement; but the fin is built up with three spars or posts of channel section to which the ribs and skin are attached. The elevator structure, however, is unlike the other control surfaces in that it is built up almost entirely from welded steel tube. The ribs are of ¼in. O/D 26 s.w.g. tube made up as a modified Warren-girder bracing inside the aerofoil contour, and

AVRO YORK

are attached to the tubular elevator "spar" which is, of course, the torque tube.

One cannot help feeling, after inspecting the York, that a great deal of careful thought and very real ingenuity has gone into its design. The use of Lancaster components wherever they could be used was, after all, only logical—it would have been rank silliness not to have done so—and this factor undoubtedly contributes largely to the general all-round excellence of the aircraft. Any aircraft with a percentage structure weight of 30 per cent. can hardly fail to be efficient.

There appear to be mixed opinions on the various internal layouts of the York, and some interesting views were expressed on a different arrangement which is being made in Canada to Avro's design, by Victory Aircraft, for Trans-Canada Airlines. This particular design appears to be an exceedingly useful one—probably the most practical layout for the York that has yet been devised.

Briefly, the central entrance and twin toilet rooms have been retained, but the wardrobe has been discarded. From this "entrance hall" the fore and aft passenger cabins are reached up two steps each side of the entry platform—this being necessary as the cabin floors have been raised to a position parallel with the thrust line. Windows have likewise been raised, and the galley discarded, the space made available enabling a total of 27 passengers to be carried, 18 in the rear and nine in the front cabins. In addition, the front cabin has been shortened by 4ft., making the crew's compartment that much more roomy and allowing the provision of locker and wardrobe space for them.

This raising of the cabin floor has necessitated raising the front cabin roof, and the hydraulic plumbing and various controls are instead run beneath the floor. In the space made available beneath the floor, air mail can be carried, either solely or together with light express freight.

There would appear to be good, common-sense grounds for doubting that the provision of a hot-meal service is necessary on runs other than those of really long range made by specific types, and the arrangement now being made for T.C.A. may well prove to be a far more useful one for general use than those rather special types so far made. A further point was made which has rather important implications; the opinion was given that the T.C.A. version of the York was a sound civil-purpose aircraft, the operation of which will be commercially acceptable.

V.C. for Canadian Pilot

The King has been graciously pleased to confer the Victoria Cross on Flt. Lt David Ernest Hornell, Royal Canadian Air Force, No. 162 (R.C.A.F.) Squadron.

FLIGHT LIEUTENANT HORNELL was captain and first pilot of a twin-engined amphibian aircraft on an anti-submarine patrol in northern waters. The patrol had lasted for some hours when a fully-surfaced U-boat was sighted travelling at high speed on the port beam. Flt. Lt. Hornell at once turned to the attack. The U-boat altered course. The aircraft had been seen and there could be no surprise.

The U-boat opened up with anti-aircraft fire which became increasingly fierce and accurate. The front guns of the aircraft replied; then its starboard gun jammed, leaving only one gun effective. Hits were obtained on and around the conning-tower of the U-boat, but the aircraft was itself hit, two large holes appearing in the starboard wing.

Ignoring the enemy's fire, Flt. Lt. Hornell carefully manœuvred for the attack. Oil was pouring from his starboard engine which was, by this time, on fire; as was the starboard wing; and the petrol tanks were endangered. Meanwhile, the aircraft was hit again and again by the U-boat's guns. Holed in many places, it was vibrating violently and very difficult to control.

Nevertheless, the captain decided to press home his attack, knowing that with every moment the chances of escape for him and his gallant crew would grow more slender. He brought his aircraft down very low and released his depth charges in a perfect straddle. The bows of the U-boat were lifted out of the water; it sank and the crew were seen in the sea. Flt. Lt. Hornell contrived, by superhuman efforts at the controls, to gain a little height. The fire in the starboard wing had grown more intense and the vibration had increased. Then the burning engine fell off.

The plight of aircraft and crew was now desperate. With the utmost coolness, the captain took his aircraft into wind, and, despite the manifold dangers, brought it safely down on the heavy swell. Badly damaged and blazing furiously, the aircraft rapidly settled. After ordeal by fire came ordeal by water. There was only one serviceable dinghy and this could not hold all the crew. So they took turns in the water, holding on to the sides. Once, the dinghy capsized in the rough seas and was righted only with great difficulty. Two of the crew succumbed from exposure.

An airborne lifeboat was dropped to them but fell some 500 yards down wind. The men struggled vainly to reach it and Flt Lt. Hornell, who throughout had encouraged them by his cheerfulness and inspiring leadership, proposed to swim to it, though he was nearly exhausted. He was with difficulty restrained. The survivors were finally rescued after they had been in the water for 21 hours. By this time Flt. Lt. Hornell was blinded and completely exhausted. He died shortly after being picked up.

Flt. Lt. Hornell had completed 60 operational missions, involving 600 hours' flying. He knew well the danger and difficulties attending attacks on submarines. By pressing home a skilful and successful attack against fierce opposition, with his aircraft in a precarious condition, and by fortifying and encouraging his comrades in the subsequent ordeal, this officer displayed valour and devotion to duty of the highest order.

The following awards have also been made to these officers and airmen of his crew:—

DISTINGUISHED SERVICE ORDER

F/O Bernard Charles Denomy.

DISTINGUISHED FLYING CROSS

F/O. Graham Campbell.
F/O. Sidney Edward Matheson.

DISTINGUISHED FLYING MEDAL

Flt. Sgt. Irael Joseph Bodnoff.
Flt. Sgt. Sidney Reginald Cole.

The official citation reads:—

In the engagement, they displayed a high degree of courage, discipline and devotion to duty, co-operating splendidly with their captain in his determination to destroy the enemy submarine. Subsequently, they suffered great hardships whilst adrift on the sea. During this long period each member of the crew assisted the other to the utmost extent, unmindful of his own distress.

NEW ZEALAND WANTS BRITISH COMMONWEALTH AIR ROUTE

NEW ZEALAND'S desire for the establishment of a British Commonwealth air route across the Pacific was emphasised by Mr. Peter Fraser, the Prime Minister, when he addressed Parliament on the work of the Prime Ministers' Conference in London.

He said he had strongly advocated that it would be possible for New Zealand, Australia, Canada and the United Kingdom to participate in the joint ownership and operation of a trans-pacific air service.

"While we do not want to enter into antagonism with our friends, I represented to the authorities in Washington that we were asking for the right to establish a British air route from New Zealand to Canada with landing rights in Honolulu, in return for landing rights for the American service operating to New Zealand," he added.

Mr. Fraser believed that reciprocal rights to be established with the U.S air line across the Pacific to Panama could be considered, but that it was not of such immediate and important urgency as the route via Canada and thence to the United Kingdom.

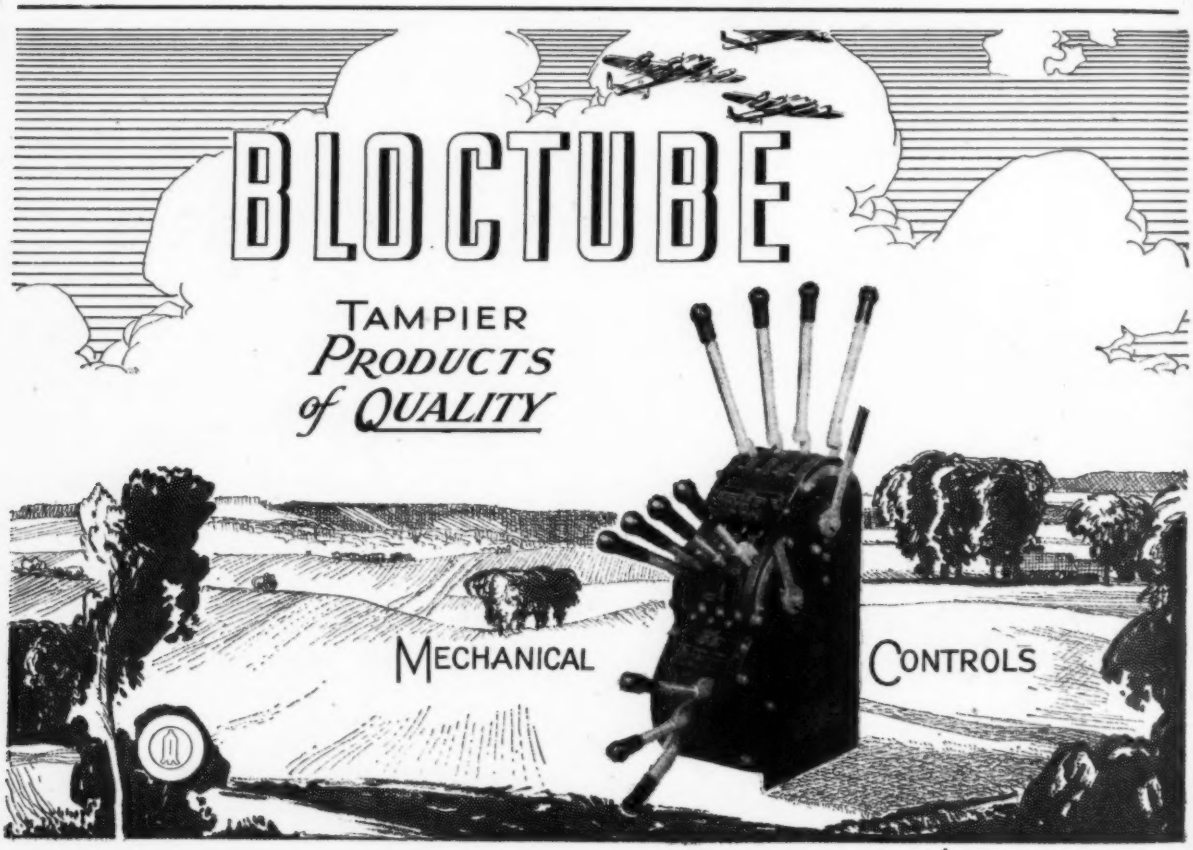
Do you know that nearly 100,000 Plugs are used in every Major Bombing Operation

POST-DATED INVITATION TO BUSY MANUFACTURERS AND DESIGNERS

We can give you **FACTS** about ALUMINIUM

When you have a moment to spare you may wish to consider the post-war possibilities of Aluminium in relation to your business. The potential uses of Aluminium alloys have increased enormously during the last few years and very few industries will remain unaffected by this development after the war. Write to Northern Aluminium and we will tell you if and how Aluminium can play an important part in your particular post-war business.

NORTHERN ALUMINIUM COMPANY LTD., BANBURY, OXON.
Makers of **NORAL** Products



Behind the Lines

Service and Industrial News from the Inside of Axis and Enemy-occupied Countries

Opposite Number

ONE of the *Luftwaffe's* crack reconnaissance pilots was shot down on the Russian front last week; his name was Edwin Bader.

A Treasure

THE order of the Sacred Treasure, first class, has been conferred posthumously on Gen. Korten by the Emperor of Japan in recognition of his excellent services for the military co-operation between Japan and Germany.

Recruiting Difficulties

MUSSOLINI'S air force is having trouble with recruiting of paratroops. The enrolment campaign, which failed to produce sufficient "daring" paratroops, had to be indefinitely prolonged by order of the Air Force General Staff.

All Out

WIVES of men of the *Luftwaffe* have formed so-called "Special Action Brigades" in various German aircraft factories, said the German Home Radio. Their job is to finish aircraft parts which are urgently required.

In five German cities municipal employees are said to have "offered" to work voluntarily on Sundays in aircraft factories.

Luftwaffe Active?

ACCORDING to German reports strong formations of the *Luftwaffe* are taking part in the "defensive battles" in Poland and on other sectors of the Russian front. They are mainly directed against Russian tanks and communications.

On the central sector, the German News Agency says, *Luftwaffe* formations under Co. Gen. Ritter von Greim have destroyed within the past four weeks 1,045 Soviet aircraft and 501 tanks. While this report would indicate intensive air fighting, the Germans have not published any figures of their own losses in the air.

A.R.P.

THE following are the standard types of air-raid shelters in use in Germany:

(1) Surface shelter (*LS—Bunker*): A bomb-proof, reinforced construction. (2) Tunnel shelters (*LS—Stollen*): A long bomb-proof underground shelter with a strengthened ceiling. (3) Cellar shelter (*LS—Kessel*): A gas, splinter and debris proof shelter in the cellar of the building. (4) Dug-out (*LS—Deckungsgraben*): A dug-out providing protection against fragments and blast. (5) Circular shelters (*LS—Rundbau*): Usually a large structure erected when other suitable cellars are not available.

For the Gullable Hun

"BRITISH fighters stationed on the Channel coast have given up their vain attempts to attack V.1 as if it were an ordinary plane," said a German Overseas News Agency war correspondent, quoted by *Reuter*.

"Up to now the British fighters have been trying to catch up with the flying bomb to attack it from the rear. These tactics have proved fruitless as the rocket has proved to be faster than the Allied pilots expected.

"British fighters now approach the V.1 from the front and send long machine-gun bursts against it.

"In most cases when the flying bomb is hit over the Channel it simply sails on and explodes on British territory. When it explodes in mid-air the British fighter usually crashes, too. The pressure of the explosion caused by the flying bomb either kills the pilot or he becomes unconscious and loses control of his machine."

Acknowledgment

"IT is no exaggeration to say that in the last few days developments in France have been dominated by the all-out effort on the part of the superior Allied Air Forces," writes Capt. Ludwig Sertorius, military correspondent of the German Overseas news agency.

"It is the air forces which are helping the Allies not only to pave the way for their own offensive operations, but also to restore critical situations resulting from German counter-attacks."

Tank-busting Bomb

A NEW German tank-busting bomb which is said to break through the steel of a tank "like a knife cuts butter" and pierces tank armour like a knife cuts paper is described in the *Berliner Illustrierte*.

The new bomb can also be employed against battleships or strongly fortified fortresses, said the paper.

Dropped from a height of 13,000ft. the bomb can pierce through the hardest steel without deforming itself.

V.I. Information

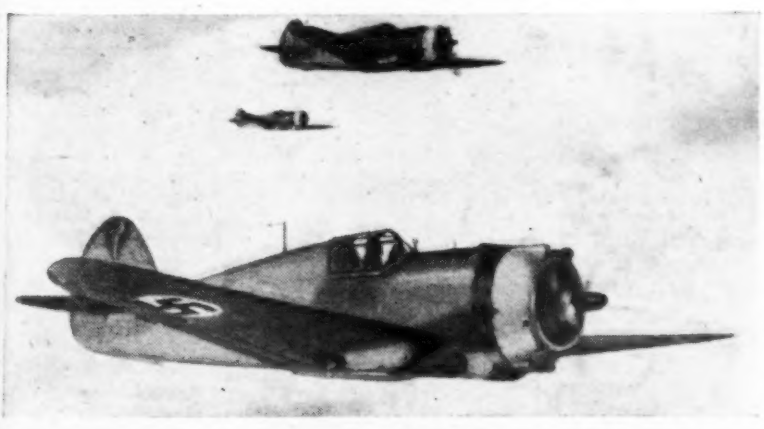
THE Berlin correspondent of a Swedish paper reports that military circles in Berlin explain that the air torpedoes have for some time been fired in two different series: (1) The projectiles are rapidly fired one after another in the same direction, forming a long "snake of fire." (2) A "fire harp" with about the same effect as a bomb carpet fired simultaneously from several bases, giving the greatest artillery effect which has been attained up till now by the robot bombs.

According to this information, Speer himself is the inventor of the air torpedo; he explained the idea at a meeting with Goering, Milch, Messerschmitt and Heinkel in January, 1943. The first models were ready after six months' preparatory work.

The New Chief

LT. GEN WERNER KREIPE the new *Luftwaffe* C.G.S., who succeeded Col. Gen Korten, killed in the attempt on Hitler's life, is one of the lesser known officers. Hitherto his name has not been given the publicity bestowed upon other leading men of the *Luftwaffe*. But, as his predecessor, the 40-years-old Kreipe is considered by the Nazis to be politically reliable, and his early association into the party and his "Blood Order" decoration certainly tipped the balance in his favour when a successor was sought.

Lt. Gen. Kreipe started his military career as an artillery officer, then changed over to the *Luftwaffe*, and at the outbreak of war was the commander of a long-range reconnaissance group. Subsequently he was appointed group commander in a battle squadron and at the time of his present appointment he was in charge of the *Luftwaffe* training command.



SWASTICATED CURTISS: A Finnish formation flying Curtiss Hawks 75-A single-seater fighters. Powered with a Cyclone engine rated at 900 h.p. the Hawk has a max. speed of 303 m.p.h. and is armed with one .50 and one .30 Mg. Two .30 Brownings can be installed in the wings.

The attack, on July 21st, on a convoy of nine transports with 30 escorts off Heligoland. Four transports torpedoed, five escorts on fire, and all ships raked by cannon and R. P.

Beaufighter Strikes

Coastal Command's Weapons Against Enemy Shipping

FROM the time Bomber Command used to send a few Whitleys or Wellingtons to attack the Hamm marshalling yards every night, enemy transport of all kinds has been high up on the priority list of targets for the Royal Air Force. Complementary to any effort over the land is the work of the "strike" squadrons of Coastal Command.

By night Beaufighters, Wellingtons and Albacores, with Swordfish and Avengers of the Fleet Air Arm, keep up a continual attack against enemy shipping but, although success is often achieved, it is frequently difficult to assess results.

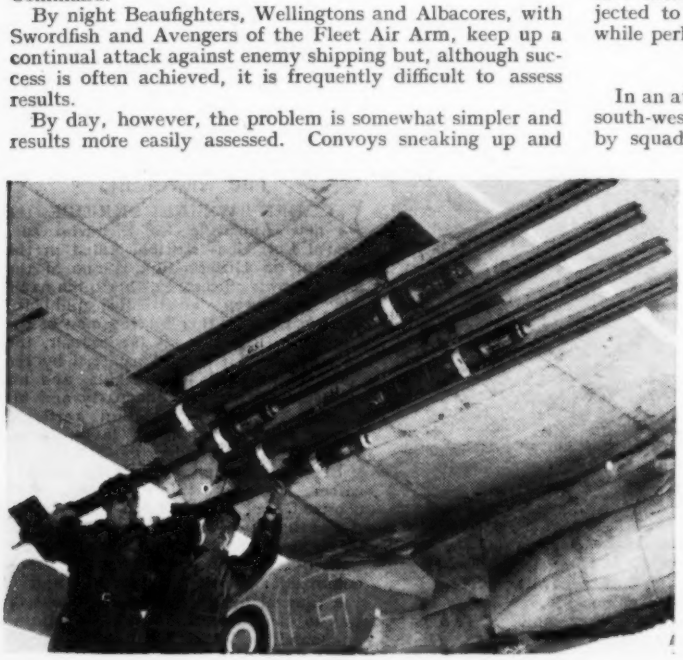
By day, however, the problem is somewhat simpler and results more easily assessed. Convoys sneaking up and down the Dutch or Norwegian coasts are attacked by strong forces of Beaufighters escorted, where necessary, by long-range fighters. Obviously, most of the shipping moves are made in the worst weather available, and the work of the reconnaissance and strike aircrews is made doubly difficult because of this. It is no holiday task going right into enemy coasts under a low cloud ceiling and be subjected to concentrated flak from ships and coastal guns while perhaps 350 miles from base.

Off Norway

In an attack on a convoy near Eigeroe, on the Norwegian south-west coast recently, a force of Beaufighters covered by squadrons of American Mustangs played havoc with six merchant ships, each of 2,000-3,000 tons, and their eight escorts. Torpedo hits were seen on three ships, and a further four vessels were seen to be on fire.

From take-off to touch-down the Beaus were away about five hours, and nothing was heard of them until after the attack was made. Then only very brief details came over the radio giving the size of the convoy and the bald statement that an attack had been made.

Eventually a formation appeared over the horizon, to be followed by others at intervals. A radio message said one pilot was trying to make base on one engine, and he arrived nearly half an hour or more behind the others. His undercarriage and flaps were not working, and a belly landing resulted in the Beaufighter going up in flames as it charged through a hedge before coming to rest. The two crew hopped out quickly and were unhurt, and the crash



Fitting rocket projectiles into the guide rails under the starboard wing of a Bristol Beaufighter.

A Beaufighter X carrying an 18-inch torpedo. This photograph was taken during a demonstration flight, during which the starboard engine was stopped and the airscrew feathered to show how the Beaufighter, fully loaded, could fly on one engine.

BEAUFIGHTER STRIKES

party were on the job immediately, smothering the aircraft in foam.

Back in the operations room where they had been briefed some hours previously the crews were being interrogated. To stand over them, and listen to the intelligence officers trying to make a complete picture, is to see a typical example of what has long been known as the "fog of war." A convoy of quite modest size may cover an area of 20 square miles, and since the attack is made by the aircraft in line abreast it is easily understandable that, in the excitement of the moment, the crews only take an interest in the ships which they actually attack.

Assessing Damage

By continual cross-questioning and suggestion, however, a rough map gradually builds up under the intelligence officers' pencils, and the path of each Beaufighter's attack is plotted. Later this is checked against the photographs taken automatically during the attack. It will then be known who has made successful hits and who has missed. For the operation in question, no fewer than 700 photographs were taken and carefully examined.

The tactics employed are simple but extremely effective. About two-thirds of the aircraft carry only cannon and rocket projectiles. These form the anti-flak section and their job is to shoot-up the ships in the convoy—there are usually three or more aircraft per ship—and as far as possible silence the A.A. guns. Since each of the Beaus carries eight armour-piercing rocket projectiles it has an offensive strength equal to the full broadside of a six-inch gun cruiser and it is not surprising that the silencing is frequently very effective!

Immediately behind the anti-flak aircraft—before the gunners can recover—the Beaufighter Xs, each carrying an 18-inch torpedo, make their attack and getaway. There was a time when airborne marine torpedoes had to be dropped from a very low height and from an aircraft flying slowly and exactly level. Even then a large proportion of the torpedoes either dived straight to the bottom of the sea or smacked the surface in such a manner that its back was broken. To-day they are incredibly clever. They can be dropped at almost any speed and from any height up to a limit of 500ft. If the release is made while the Beaufighter is jinking, the torpedo automatically takes up a level attitude.

Engine design for marine torpedoes has remained static for many years. Basically it is a 4-cylinder radial compressed-air engine with a bore and stroke of 4 inches. As the air passes to the engine from the reducing valve it is mixed with a quantity of light diesel oil and the resulting mixture fired. This, of course, greatly increases the pressure of the available gases. It will be interesting to see whether, at some future date, the reciprocating engine will give place to a turbine with the exhaust gases assisting in the form of jet propulsion. This system appears to have possibilities for aircraft and it may be that longer range and greater speed may be given to marine torpedoes by its use.

To return to things aeronautical. When it was suggested to the pilots that the renowned Beaufighter was "on its way out" after many years of good service, they were most indignant. They could not imagine a better aircraft for the job. It was fast enough, highly manœuvrable and the view for attack excellent. Range is ample since there can be no relief of the pilot.

There is some considerable difference of opinion between pilots as to the effectiveness of the two weapons—torpedo or rocket projectile—for the actual job of destroying the ships. As an anti-flak weapon the Beau with R.P. and 20 mm. cannon is peerless. Two or three of them attack one ship smother the whole deck with missiles, and it is the opinion of pilots that this is sufficient to destroy merchantmen and light naval forces. The Torpedo-Beau pilots, on the other hand, delight in the effectiveness of their sleek weapon. In their eyes the torpedo is a thing of beauty, and it cannot be gainsaid that the explosion of a modern warhead against the hull of a ship of any kind usually means the end of that ship. The argument between the two enthusiasts usually takes the form of a discussion as to the accuracy of aim. The R.P. pilots reckon they can put their shells on a pocket handkerchief and the torpedo pilots say "If only you subdue the flak for us we will hit the ships and sink them." This loyalty to aircraft and weapons is common throughout the whole R.A.F., and, while it is a very desirable thing, it is prone to mislead earnest enquirers.

AIRBORNE ARMY

SUPREME Headquarters has announced the combination of all its airborne forces, both American and British, under one command to form an airborne army. In this command will be all the combat troops, gliders and the paratroop and tug aircraft. Lt. Gen. Lewis H. Brereton, United States Army, is to command the new army, and his deputy will be Lt. Gen. Frederick A. M. Browning, C.B., D.S.O., who has been responsible, almost entirely, for the formation and training of airborne troops in the British Army.

We have large airborne forces now available, and it is thought that the new organisation at the disposal of Gen. Eisenhower will make them more effective. The formation of this new army represents a great advance on anything the Germans have done with airborne troops. They have never organised any formations larger than a division, and even these were not independent units because they had to rely solely on the *Luftwaffe* for aircraft and aircrews. The Anglo-American Airborne Army will have none of these drawbacks.

Major Gen. Hoyt S. Vandenberg, United States Army, Deputy C.-in-C. A.E.A.F. under Sir Trafford Leigh-Mallory, has assumed command of the U.S. 9th A.A.F. in place of Lt. Gen. Brereton.

Major Gen. Ralph Royce, it is also announced, now becomes Deputy C.-in-C. Allied Expeditionary Air Forces.

Cadets Build a Cadet

First Glider to be Constructed Entirely by the Air Training Corps

IN February of 1942, squadrons of the Birmingham Wing were invited by the Midland Command to undertake the ambitious project of constructing Kirby Cadet gliders. No. 476 Squadron, whose headquarters are at Vickers-Armstrongs, Castle Bromwich Works, Birmingham, agreed to build one, having suitable facilities kindly provided by the factory management. It was thought that few enterprises could offer basic training of the high standard which would be provided by glider construction. No. 476 Squadron was fortunate in having a Technical Officer of great enthusiasm and ability in F/O. Carson-Abbott, who welcomed the proposal, as well as a most capable Civilian Instructor, Mr. McMurray, a Senior Examiner of the A.I.D., who was able to apply standard A.I.D. inspection routine on every part.

The raw materials necessary for the metal work became available in September, 1942, and the cadets of the Basic Fitting Class were able to make an eager start. Drawings for the metal details were intelligently interpreted, and the pride taken by the cadets in the completed details gave great satisfaction. Standard aircraft practice was employed on all branches of the work. Each accepted detail was clearly marked on a graph, and it was most interesting to watch the progress shown by the graph.

About this time three other squadrons of the North Birmingham Sub-Wing undertook to carry out parts of the work at their headquarters, these parts to be brought to the parent squadron's headquarters for inspection and assembly. Daughter Squadron No. 495 (Sutton Coldfield) agreed to make details for wing attachments, the fuselage fairings and the rudder; No. 165 Squadron (Fort Dunlop) the elevator and tailplane; and No. 482 Squadron (Wolseley) some of the forty wing ribs, together with some of the metal details.

Pattern Provided

After some months the timber for frames, longerons and ribs was received, and jigging became urgent. An interested friend kindly provided two jigs for wing ribs, but apart from these the task of building jigs for frames and wing ribs was carried out by No. 476 Squadron. Technical assistance in connection with snags was given by Flt. Lt. Garner Hayward, Staff Officer of the Midland Command, A.T.C., who provided a complete Kirby Cadet glider (factory built) for close inspection, and facilitated the provision of material as necessary. Gradually the jigs were constructed, and soon the fuselage frames were ready. Then the day came when the longerons and frames were assembled in the jig, and a skeleton fuselage took form. The pride of those cadets who had patiently worked so long at the details can be imagined, although much still remained to be done before the fuselage was complete. At this time a request for "six off" was received from the Midland Command. This was a source of inspiration to all concerned, and in view of the amount of work involved the C.O. of No. 476 Squadron released F/O. Carson-Abbott from all squadron duties to concentrate on the glider construction.

Final Erection

The main wing spars, 38ft. 6in. span, took shape, and as more wing ribs from 482 and 476 Squadrons appeared, visions of the completed wing began to appear in the minds of the hopeful builders.

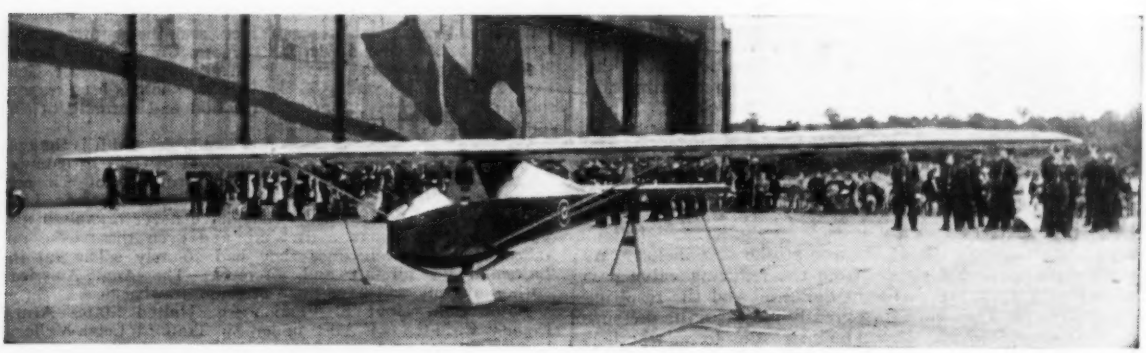
Work on the second aircraft was going ahead, and two fuselages, one in frame, and one skinned, made an impressive show. With the final skinning and spraying of the fuselage, and the installation of control cables, a completed fuselage became a feature of the workshop. More metal details for glider No. 2 from 482 Squadron ensured full occupation for instructors and cadets.

Meanwhile, the wing ribs were being fitted to the port main spars. To complete the frame of the port wing with main spars and cross-bracing took about two months up to the end of April, 1944, and then work began on the starboard wing. Five weeks later, both port and starboard wing frames were attached to the fuselage.

The final covering with fabric and the doping of the structure now took place. A remarkable feature of the past few weeks had been the speed with which the starboard wing had been assembled as compared with the port wing. The test flight was made on July 16th, and was highly successful, pilots of the aircraft being high in their praise of its handling qualities. The glider maintained level flight, hands off, and was smooth in control.

Final camouflage and polishing of wings and control surfaces were the only outstanding items, and these were cleared for the final handing-over ceremony on Saturday, July 29th, to Air Marshall Sir Leslie Gossage, K.C.B., C.V.O., D.S.O., M.C., Chief Commandant and Director-General of the Air Training Corps, on behalf of the squadrons concerned, when the aircraft was flown by Grp. Capt. J. A. Cecil Wright, M.P., Midland Area Commandant, before a gathering of A.T.C. personnel, civic personalities, families and friends.

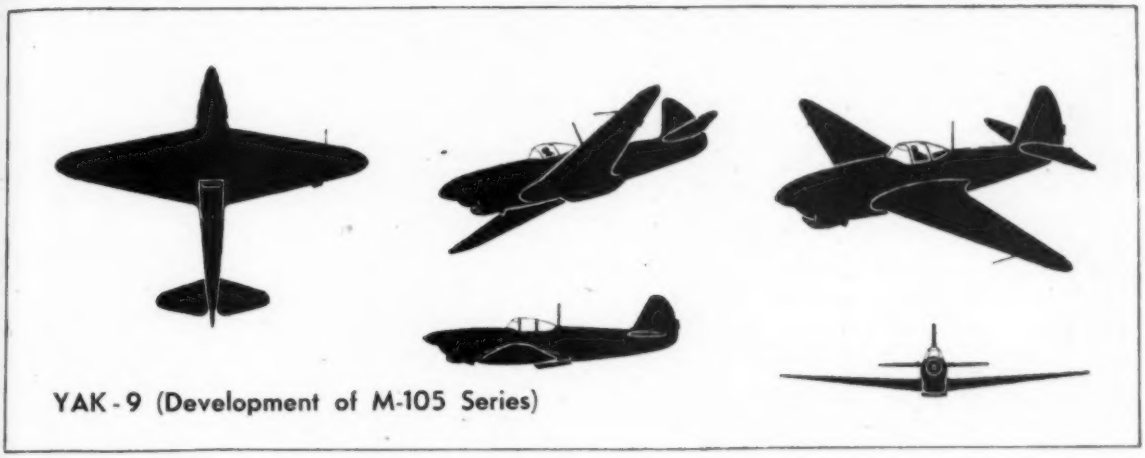
This completion in approximately 2,500 man-hours of voluntary work of the first A.T.C.-built glider is in itself a striking tribute to all concerned. They have been rewarded with the simple but far-reaching statement: "The A.T.C. has made a safe and efficient glider."



A PROUD MOMENT: The Kirby Cadet built by squadrons of the A.T.C. was officially handed over to Air Marshal Sir Leslie Gossage on July 29th and was flown by Group Captain J. A. C. Wright, M.P

Studies in Recognition

Aircraft in Flying Attitudes

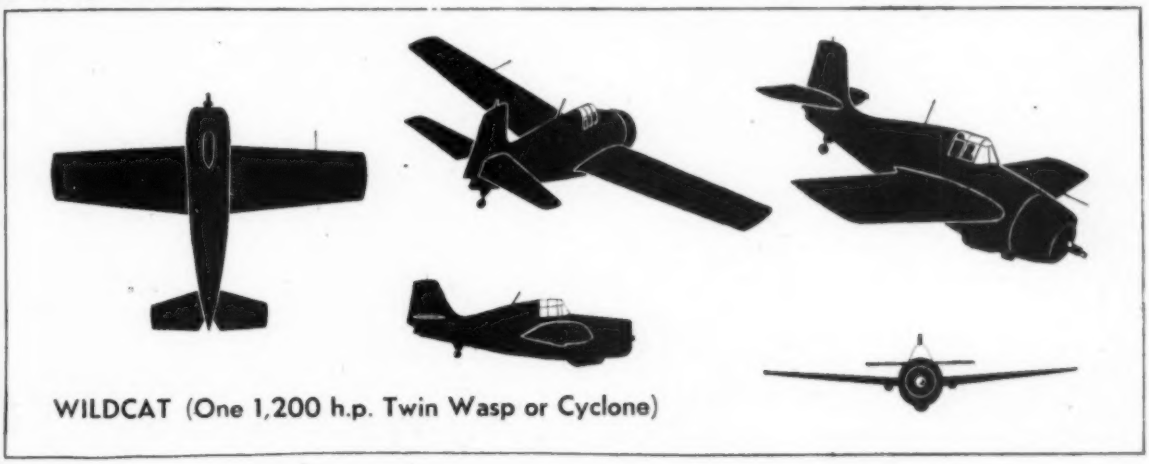


YAK-9 (Development of M-105 Series)

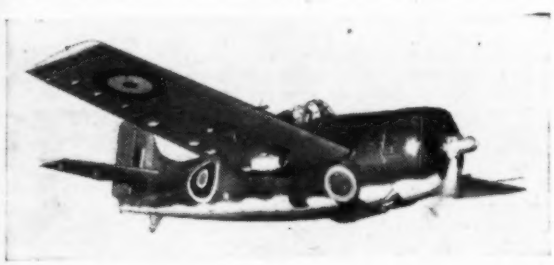
IT was not until the Germans attacked Russia and the YAK-1 went into action that this type of Russian fighter became known in this country. The YAK-9 is the latest development of the series designed by Alexander Yakolev, who had previously specialised on trainers, and has recently come into the news as partnering the Mustang as long-range escort for the U.S. A.A.F. heavy bombers on their shuttle raids between Britain, Russia and Italy. Power is supplied by a liquid-cooled V-type 12-cyl. engine which is a development of the 1,100 h.p. M-105. Its present rating is not divulged by the Russians, but it is reported to have a top speed of 390 m.p.h.

Recognition features include well tapered wings and tailplane with almost pointed tips. Typhoon-like fuselage with teardrop cockpit cover but radiator amidships. Dimensions: Span 32ft. 10in., length about 28ft.

Yak-9 Single-seater Fighter



WILDCAT (One 1,200 h.p. Twin Wasp or Cyclone)



Grumman Wildcat Single-seater Fighter.

WHEN the Grumman Wildcat was first acquired by the Fleet Air Arm it was given the name of Martlet, but this was later dropped and it is now the Wildcat in both British and American Naval services. Its official U.S. Navy designation is F4F-4. Either a 1,200 h.p. (take off) Pratt and Whitney Twin Wasp or Wright Cyclone is fitted, top speeds being 330 m.p.h. and 325 m.p.h. respectively. The British version has six 0.303in. machine guns in the wings.

The Wildcat is easily recognised by its low aspect-ratio mid-wings with square tips and tailplane to match, short tubby fuselage and angular fin and rudder relieved by a small fillet at the foot of the leading edge. Although being gradually superceded by the Hellcat, many Wildcats are still giving valuable service. Dimensions: Span 38ft., length 28ft. 10in., height 9ft. 3in., wing area 260 sq. ft.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

UP-TO-THE MINUTE

Loughborough Anticipates Wayne

YOU state that Wayne University stole a march on the rest of America's colleges by offering a course in jet propulsion next September (*Flight*, August 3rd).

Courses at Loughborough College have included lectures on gas turbines and marine and aeronautical jet propulsion for at least the last year. D. CRUICKSHANK.

AIRCRAFT ENGINEERING TRAINING

Every Main Type Covered

WITH reference to Mr. F. Ashley's letter in *Flight* of August 3rd, I must disagree with several of his remarks. Training for future fitter II (engines) is very complete and covers every main type from two-strokes to Sabres and the Centaurus as well as most modern American types.

As for Charles' and Boyle's law, I was taught these in my first month of training. Mr. Ashley must have left Halton a long, long time ago, and would receive many pleasant shocks if he returned for a look around. R. MACARTHUR.

Pedantic Instead of Practical

YOUR ex-Halton apprentice correspondent, F. Ashley, writing in *Flight* of August 3rd, is right on the target in his criticism of the training given at what ought to be the greatest of instructional centres.

As an ex-civilian instructor at the same school, compelled to resign from sheer disgust at the sort of "gen." we were supposed to impart, I am convinced that the training given fails because the syllabus is based on pedantic instead of practical lines.

Why, for instance, it should be necessary, before using a file, to know the chemical composition of the file, or to know why a micrometer reads in "thous" or "ten thous" would seem to any practical man of far less importance than knowing how to use the thing. After all, any more than usually interested type can satisfy his own curiosity on such matters at any free library without having to devote valuable training time to this purpose.

The number of similar quaint ideas on what an apprentice, or worse still a trainee, should absorb in these days of curtailed courses must run into hundreds, and the galling part of it all is that the instructors would themselves be the first to admit it.

Lest, however, too many instructors should feel tempted to follow my course, I would hasten to inform them that, although now in a "more important" Government job, I am still only doing a job which, in any private profit-making concern, would be performed, without undue exertion, by a 14-year-old office girl, and am "bossed" by people whose hands have never become dirtied by practical work. So the same policy is evidently pursued right up the scale!

"WASTED."

POST-WAR AVIATION

Avoiding International Disputes

(By Airgraph from Australia)

I AM a regular reader of your magazine and submit the following letter in connection with post-war aviation questions. Have only just received copy *Flight* 16/3/44, and so hope that I am not too far behind the trend of debate.

One serious objection to international airline run on a purely competitive basis is that it promises one of the worst sources for international dispute. The struggle for domination will in the long run be won by that nation or group with the greatest resources. Agreed or not, the struggle itself may well lead to war. As a counter to such an eventuality and as a solution to the problem of post-war civil aviation the following idea is offered.

Allow all those airlines controlled by individual nations to operate with as little restriction as possible, but at the same time the suggestion is for the United Nations or World Parliament in control after the war to sponsor, finance, organise and control airlines of its own. The policy of the organisation would be that of all nations and therefore in the best interests of all. Its dimensions would have to be no smaller than the largest private concern but at the same time not so large as to stifle all others in the field, and aircraft could be a selection of the best, and only the best, the world has to offer. Its airfields would not be limited. Hence there would be no restriction of international rights because the enterprise would be the common concern of all nations. Its staff, ground, air, administrative and executive, would be selected on the basis of ability alone. Difficulties of language do not loom large in face of what has been done in R.A.F. where men of many nations are found.

The operation of the service would include all ordinary airline business—transportation of business men, officials and others, freight, mail, etc.—and it could include the use of the airline in opening up outlying and backward parts of the world.

One envisages an administration incorporating the latest ideas in efficiency, combined with wise and energetic leadership. The project would have to be soundly supported financially, the burden being borne proportionally by the nations. It would be a very light one for individual nations until the enterprise realised a credit.

Similar organisations are to be found in the British P.M.G. department and services, but the best analogy is the Australian radio service. Here we find private and Government enterprise in open and healthy competition, providing a most satisfactory service. Contrast with America wholly commercial and England wholly B.B.C., with no advertising.

There is every hope, therefore, for a highly successful civil aviation service of the sort outlined. The most immediate virtue is the elimination of mistrust and jealousy, because the system is designed for satisfaction in all quarters. The most important virtue is that it offers practical opportunity for international co-operation and understanding. R. D. ARCHER.

THE RAILWAYS AND CIVIL AVIATION

British Equipment Preferred if . . . .

REFERRING to the letter signed "Moorhen" in the issue of *Flight* for August 3rd, it goes without saying that the British railways would be only too glad to purchase British aviation equipment in preference to any other if it is suitable and available at the right time. Any other policy would be out of keeping with their past tradition and practice.

I should like to thank the writer for his reference to my recent article in *Flight* and for his friendly and common-sense attitude towards the offer which the British railways have made to provide comprehensive air services without subsidy, provided no one else is subsidised against them.

JOHN ELLIOT,
Deputy General Manager, Southern Railway.
Director, Railway Air Services, Ltd., etc.

INEFFICIENT EFFICIENCY

Urgent Need for the Team Spirit

I CANNOT let the opportunity pass of congratulating *Flight*, and the writer, on the article which appeared in your issue of August 3rd, page 118.

To my mind, it is the best, most timely and most important article which has ever appeared in your paper, other than those of a technical or specialist nature, for at least fourteen years.

Never, in this century, has industry required its attention to be drawn, so forcibly, to the necessity for team spirit and individual incentive as at this very moment. Never have we had such fine examples of team spirit as in our fighting forces to-day on all fronts.

Never, maybe, will we have another opportunity, such as exists to-day, to co-operate and work together and to eradicate by example once and for all the Gestapo methods which have been used by so many would-be dictators in industry and teach them that to encourage and foster individual initiative and show appreciation, as opposed to jealousy, of success is the only way in which they themselves can ever expect to achieve those results, the value of which they will not be in constant fear of losing. "COMPANY DIRECTOR."

'TAIN'T NATURAL'

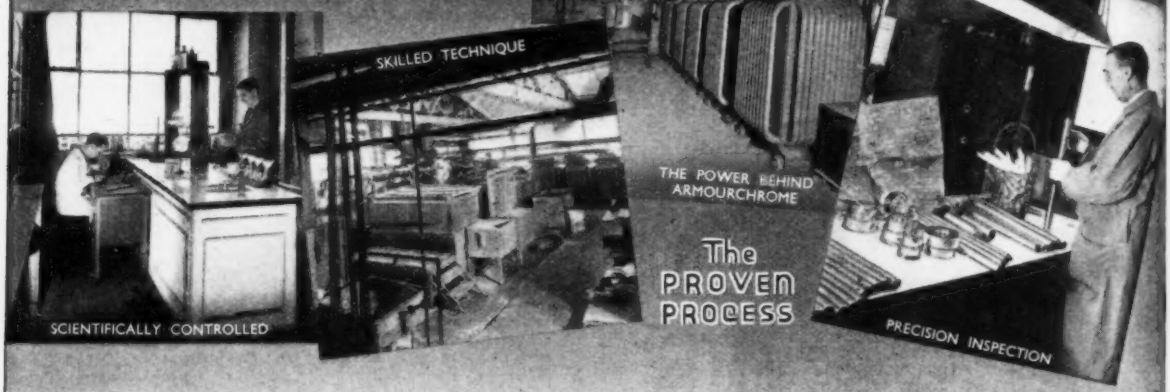
Those who plan the Air Services of the future should take note of this gentleman. There are still millions like him. A 'plane to them is a 'chancey' thing. Speedy? Yes. Exciting? Yes. Safe? No, not by long chalks. What will change their attitude? Not faster 'planes, or longer flights, or even 'planes with cocktail bars. They will accept flying as natural when a 'plane journey is as certain, as regular, as 'safe' as a train journey

FIELD AIRCRAFT SERVICE

A Company of the HUNTING Group • FIELD CONSOLIDATED AIRCRAFT SERVICES LIMITED
LONDON OFFICE: BYRON HOUSE, ST. JAMES'S STREET, S.W.1

C. R. Casson 2

ARMOURCHROME

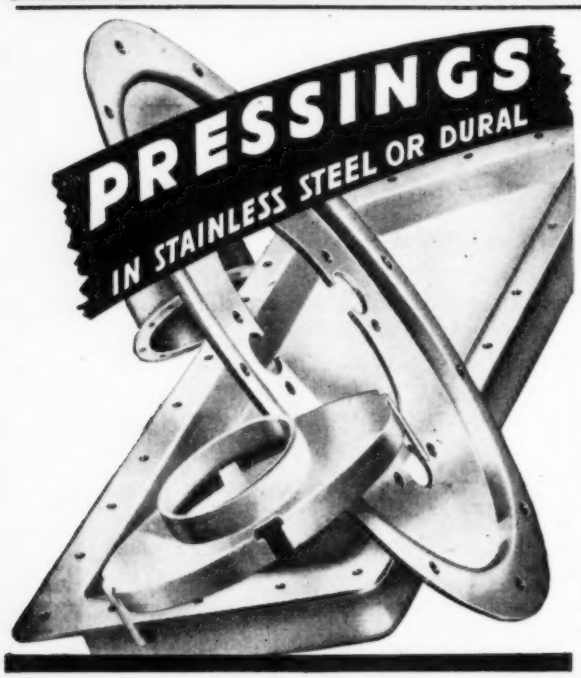


The
BRIGHTSIDE PLATING Co LTD
BREARLEY STREET, BIRMINGHAM 19
Telephone: ASTON CROSS 2663-4

Hard Chromium
FOR INCREASED WEAR RESISTANCE. THE BUILDING UP OF OVER-MACHINED PARTS, etc. PARTS IN SHORT SUPPLY MAY BE SALVAGED BY THE APPLICATION OF "ARMOURCHROME"—IMPLEMENTS OF WAR THUS GIVEN NEW LIFE, i.e.

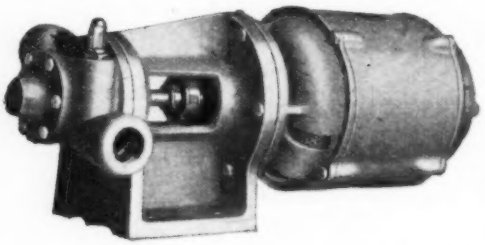
Moulds and dies—for Plastics, Glass, Rubber, etc.
Precision Tools,
Files, Taps, Reamers,
Gauges—limit, snap, ring, etc.
Dies for drawing seamless tube, etc.
Mandrels,
Broaches, shafts,
Jigs, Welding fixtures, etc., etc.

We hold ourselves available for consultation and would take pleasure in treating a component for you for your own test and observation.
SCIENTIFICALLY CONTROLLED METHODS AND TECHNIQUE—FULLY APPROVED BY THE WAR MINISTRIES AND GOVERNMENT TEST AND RESEARCH LABORATORIES.



METAL PROPELLERS LTD
Stainless Steel Specialists
PURLEY WAY · CROYDON
PHONE: THORNTON HEATH 1404 (4 LINES) GRAMS: METAPROPS, PHONE, LONDON.

VARLEY
V. O. (VANE OIL) PUMPS



Specifically designed for dealing with oils of high viscosity. Their reliability, robustness and versatility make Varley V.O. Pumps particularly useful for supplying oil to machine tools at low or high pressure, for transfer work and hydraulic applications.

•

VARLEY ALSO MAKE DOUBLE HELICAL GEAR PUMPS · HEAVY DUTY GEAR PUMPS · CENTRIFUGAL SUDS PUMPS · PETROL DISPENSING PUMPS

•

VARLEY PUMPS AND ENGINEERING LTD.,
Weston-Super-Mare, Somerset.
Telephone: 776/7 Telegrams: Paracyclic, W-S-M.

OFFENSIVE PORTRAIT: A head-on view of a Typhoon with its cannon, rockets and four-bladed airscrew clearly shown.

SERVICE AVIATION

Royal Air Force and Fleet Air Arm News and Announcements

Appointments

Air Vice-Marshal W. ELLIOT, C.B., C.B.E., D.F.C., to be Air Officer Commanding, Balkan Air Force.

Air Vice-Marshal A. C. STEVENS, C.B., to be Air Officer Commanding, R.A.F., Gibraltar.

Act. Air Vice-Marshal A. GRAY, C.B., M.C., to be Deputy Air Commander, R.A.F., Component, Eastern Air Command, S.E.A.C.

Act. Air Vice-Marshal T. M. WILLIAMS, C.B., O.B.E., M.C., D.F.C., to be Assistant Chief of Air Staff (Operations).

Air Comdre. J. M. MASON, D.S.C., D.F.C., to be Air Officer in Charge of Administration of a R.A.F. Group, S.E.A.C.

Act. Air Comdre. C. W. BUSK, M.C., A.F.C., to be Commandant, Empire Central Air Armament School.

Air Comdre. T. C. St. C. MORTON, O.B.E., M.D., Ch.B., F.R.C.P., D.P.H., D.P.M., D.T.M. & H., has been appointed an Honorary Physician to the King, in succesison to Air Comdre. H. L. BURTON, M.B., B.S., D.P.M., who has vacated the appointment on retirement from the Royal Air Force. July 5th, 1944.

Promotion

GENERAL DUTIES BRANCH.

Air Vice-Marshal A. DURSTON, C.B., A.F.C., is granted the rank of Act. Air Marshal. April 1st, 1944.

Retirements

GENERAL DUTIES BRANCH

Group Capt. L. L. MACLEAN has reverted to the retired list, retaining the rank of Air Comdre. August 2nd, 1944.

MEDICAL BRANCH.

Air Comdre. H. L. BURTON, M.B., B.S., D.P.M., K.H.P., is placed on the retired list. July 5th, 1944.

Awards

Far East

THE KING has been graciously pleased to approve the following awards in recognition of gallantry displayed in flying operations against the enemy in the South-West Pacific area:—

Distinguished Service Order

Wing Cdr. C. W. K. NICHOLLS, R.A.F.O., with effect from June 29th, 1944.

Bar to Distinguished Flying Cross

Wing Cdr. C. C. LEARMONTH, D.F.C., R.A.A.F. (deceased), with effect from January 5th, 1944.

Distinguished Flying Cross

Wing Cdr. C. P. GLASSCOCK, R.A.A.F. (deceased), with effect from September 18th, 1943.

Flt. Lt. R. H. S. GRAY, R.A.A.F., with effect from July 7th, 1944.

THE KING has been graciously pleased to approve the following awards in recognition of gallantry and devotion to duty in execution of air operations:—

Distinguished Service Order

Act. Wing Cdr. J. N. DAVENPORT, D.F.C., R.A.A.F., No. 455 (R.A.A.F.) Sqn.—This officer has taken part in a large number of sorties, including many attacks on shipping, during which much loss has been inflicted on the enemy. Recently, he led a formation of aircraft in an attack on an enemy convoy which was escorted by armed ships. In spite of fierce opposing fire, a most determined and successful attack was made. Two medium-sized merchant vessels and one of the escorting vessels were very severely damaged. In this well-executed operation Wing Cdr. Davenport displayed high powers of leadership, great skill and determination, which contributed materially to the results obtained. This officer has rendered great service, and his sterling qualities have impressed all.

Lt. Cdr. (A) A. B. Fraser-Harris, D.S.C., and Bar, from a drawing by Lt. (A) G. O. Richmond-Jones.

Act. Sqn. Ldr. J. BAKER, D.F.C., R.A.F.V.R., No. 405 (R.C.A.F.) Sqn.—This officer has participated in a very large number of sorties involving attacks on a wide range of well-defended enemy targets. He is a fearless and devoted member of aircraft crew, whose determination to bomb his targets accurately has won him great success. In the air and on the ground his conduct has been exemplary, and he has set the finest example of devotion to duty, never sparing himself in his efforts to strike at the enemy at every opportunity.

Flt. Lt. D. W. PECK, D.F.C., R.A.F., No. 627 Sqn.—Since being awarded the D.F.C., this officer has completed a very large number of sorties, and his achievements have won great praise. He has invariably displayed a high degree of skill, courage and resolution, and his example has been most inspiring. On a recent occasion he piloted an aircraft on a sortie against Munich. When over the target his aircraft was hit by anti-aircraft fire whilst illuminated in the searchlights. One engine was rendered useless, and a little later the aircraft went out of control. Considerable height was lost, but Flt. Lt. Peck succeeded in regaining control and then, with his usual determination, continued his mission, which he completed successfully.

Bar to Distinguished Flying Cross

Act. Sqn. Ldr. C. P. N. NEWMAN, D.F.C., R.A.F.O., No. 54 Sqn.—This officer has completed a large number of sorties, many of them in bad weather and over difficult country. He is a most inspiring and gallant leader whose example has contributed materially to the high standard of operational efficiency of the squadron, which he has commanded so successfully for several months.

Act. Sqn. Ldr. J. H. EVANS, D.F.C., R.A.F.V.R., No. 49 Sqn.—This officer has completed a second tour of operations during which he has taken part in very many attacks on targets in Germany. He has displayed the highest qualities of skill throughout and his example of courage and determination in the face of heavy opposition has been most inspiring. He is an extremely able flight commander whose services have been of great value.

F/O. J. T. CAINE, D.F.C., R.C.A.F., No. 418 (R.C.A.F.) Sqn.—This officer continues to display the finest qualities of skill and determination. In a sortie in March, 1944, he shot down two enemy aircraft, whilst in another operation in April, 1944, he shot down two Ju 52s and damaged a He 111 on the ground. Since then, F/O. Caine has destroyed one more enemy aircraft. This officer is a fearless and relentless fighter and has been responsible for the destruction of nine enemy aircraft in the air and damaged four on the ground.

Act. Sqn. Ldr. E. N. BUNTING, D.F.C., R.A.F.V.R., No. 486 (N.Z.) Sqn.—This officer has completed a very large number of sorties and has displayed a high standard of skill and keenness throughout. He has destroyed seven enemy aircraft at night, successes which pay a good tribute to his ability and resolution.

Flt. Lt. C. P. Reed, D.F.C., R.A.F.V.R., No. 488 (N.Z.) Sqn.—This officer is an observer of high merit, and his example of courage and resource has been most praiseworthy. He is a very valuable member of aircraft crew, and has assisted in the destruction of 11 enemy aircraft at night.

Act. Sqn. Ldr. N. A. J. Mackie, D.F.C., No. 83 Sqn.—Since being awarded the D.F.C., this officer has completed many sorties, and has continued to show the highest qualities of skill and devotion to duty. His successes are an excellent tribute to his unswerving determination to make every sortie a success.

Distinguished Flying Cross

Lt. Lt. MacA. Forbes, R.A.F.V.R., No. 53 Sqn.
Flt. Lt. J. A. S. Hall, R.A.F.V.R., No. 488 (N.Z.) Sqn.
Flt. Lt. P. W. Kemmis, R.A.F.V.R., No. 169 Sqn.
Flt. Lt. R. G. Woodman, R.A.F.V.R., No. 169 Sqn.
F/O. L. J. Bateman, R.C.A.F., No. 407 (R.C.A.F.) Sqn.
F/O. J. P. W. Cairns, R.A.F.V.R., No. 488 (N.Z.) Sqn.
P/O. A. B. L. Winstanley, R.A.F.V.R., No. 514 Sqn.
Flt. Lt. J. M. Pilcher, R.A.A.F., No. 455 (R.A.A.F.) Sqn.
Act. Flt. Lt. F. R. Harris, R.C.A.F., No. 78 Sqn.
F/O. R. H. Cannell, R.A.F.V.R., No. 489 (N.Z.) Sqn.
F/O. I. H. Masson, R.A.F.V.R., No. 455 (R.A.A.F.) Sqn.
P/O. R. J. Auckland, R.A.F.V.R., No. 61 Sqn.
P/O. R. J. Lone, R.A.F.V.R., No. 626 Sqn.
P/O. C. H. Ogden, R.A.F., No. 105 Sqn.
W/O.2 J. H. Hayes, R.C.A.F., No. 254 Sqn.
Flt. Lt. W. G. Shadforth, R.A.F.V.R., No. 115 Sqn.
W/O. R. D. Curtis, R.C.A.F., No. 97 Sqn.
W/O. J. C. Dickinson, R.C.A.F., No. 9 Sqn.
W/O. J. B. Findlay, R.C.A.F., No. 97 Sqn.
W/O. G. D. Hirschfeld, R.C.A.F., No. 405 (R.C.A.F.) Sqn.
W/O. A. B. Leslie, R.C.A.F., No. 405 (R.C.A.F.) Sqn.
W/O. W. Lindo, R.C.A.F., No. 76 Sqn.
W/O. J. S. Minogue, R.C.A.F., No. 156 Sqn.
W/O. R. A. Westad, R.C.A.F., No. 619 Sqn.
P/O. G. B. Page, R.N.Z.A.F., No. 51 Sqn.

Distinguished Flying Medal

Sgt. A. W. Robinson, R.A.F.V.R., No. 625 Sqn.
Sgt. J. Tomlinson, R.A.F.V.R., No. 166 Sqn.
Flt. Sgt. G. R. Carlile, R.A.A.F., No. 106 Sqn.
Flt. Sgt. (now P/O.) C. H. Tindale, R.A.A.F., No. 460 (R.A.A.F.) Sqn.
Flt. Sgt. C. J. Medland, R.A.F.V.R., No. 514 Sqn.
Flt. Sgt. J. Playford, R.A.F.V.R., No. 151 Sqn.
Flt. Sgt. A. J. Duguid, No. 260 Sqn.
Flt. Sgt. N. D. Forbes, R.A.F.V.R., No. 502 Sqn.
Sgt. R. A. Edie, No. 635 Sqn.
Sgt. A. J. Veale, R.A.F.V.R., No. 115 Sqn.
Sgt. R. W. T. Weir, R.A.F.V.R., No. 115 Sqn.

THE KING has been graciously pleased to approve the following award:—

M.B.E. (Mil.)

F/O. A. J. T. Bridgland, R.A.F.—In December, 1943, F/O. Bridgland was in command of a high-speed launch during a raid on Bari harbour, when ammunition ships were blown up, causing great damage and loss of life. He took his boat alongside a badly damaged benzine tanker which was lying less than 100 yards from other burning tankers and exploding ammunition ships, in order to rescue the crew of the damaged tanker. Disregarding his own safety, F/O. Bridgland searched along the line of burning vessels and rescued some survivors. He also picked up others from a raft. After landing those whom he had rescued, this officer made a second trip to find the engineer of the tanker, but in this he was unsuccessful. He picked up another injured man, however, but the latter unfortunately died whilst returning to shore. F/O. Bridgland displayed courage of a high order on this occasion, and he has invariably set a fine example to all personnel in his unit.

SERVICE AVIATION

Foreign Decorations

THE KING has granted unrestricted permission for the wearing of the undermentioned decorations conferred upon the personnel indicated in recognition of valuable services rendered in connection with the war:—

Conferred by the President of the United States of America

Legion of Merit (Commander)

Air Chief Marshal Sir Sholto Douglas, K.C.B., M.C., D.F.C., R.A.F.

Distinguished Flying Cross

Group Capt. C. P. Green, D.S.O., D.F.C., R.A.F.
Group Capt. J. A. Powell, D.S.O., O.B.E., R.A.F.
Maj. E. U. Brierly, D.F.C., S.A.A.F.
Flt. Lt. M. R. Clarke, R.N.Z.A.F.
Flt. Lt. W. Sterne, R.A.F.V.R.
Flt. Lt. R. F. Hayes, D.F.C., R.A.F.
Lt. A. M. Miller, S.A.A.F.
Sgt. C. Horne, R.A.F.V.R.

Roll of Honour

Casualty Communiqué No. 413.

THE Air Ministry regrets to announce the following casualties on various dates. The next of kin have been informed. Casualties "in action" are due to flying operations against the enemy; "on active service" includes ground casualties due to enemy action, non-operational flying casualties, fatal accidents and natural deaths.

Of the names in this list, 100 are second entries giving later information of casualties published in earlier lists.

Royal Air Force

Killed in Action.—Sgt. R. L. Clark; Sgt. L. Cotton; Sgt. J. J. Eaton; Sgt. A. A. H. Hodson; F/O. G. W. Lewis; F/O. K. H. Ray; Sgt. A. M. Weir; Flt. Lt. T. L. M. Woods.

Previously Reported Missing, Believed Killed in Action, Now Presumed Killed in Action.—Sgt. M. C. D. Bennett; Sgt. A. S. Burgess; Sgt. J. C. Cole; Sgt. J. Dobson; Sgt. T. Duffy; F/O. P. R. Flyte; F/O. W. R. Forester; Sqn. Ldr. D. P. McKeown, A.F.C.; Sgt. G. S. Meaking; F/O. E. F. Myers; Sgt. B. Royans; P/O. S. R. Trill; Sgt. P. Twiddy; Flt. Lt. A. R. Wall; Flt. Sgt. T. White.

Previously Reported Missing, Now Presumed Killed in Action.—Sgt. J. F. A. Bailey; Sgt. P. S. Barnett; Sgt. E. N. N. Belden; Sgt. J. P. Belfield; Sgt. J. B. E. Birrell; Sgt. B. C. L. Boyd; Sgt. D. D. Boyd; Sgt. H. Brown; Flt. Sgt. C. G. Carrington; F/O. H. K. Coates; P/O. T. Collins; Sgt. A. M. Cowgill; Sgt. F. G. Cowler; Flt. Sgt. B. S. Cox; Sgt. W. G. H. Dadge; Sgt. F. W. Day; Sgt. D. H. Douglas; P/O. J. M. Dunlop; Sgt. J. Erskine; Sgt. W. A. Ewart; Sgt. R. S. Facey; Flt. Sgt. C. S. Field; Sgt. A. M. Finfer; F/O. J. Fort, D.F.C.; Sgt. P. Fowler; Sgt. R. A. Freeman; Flt. Sgt. H. J. French; Sgt. L. Gardner; Sgt. H. J. Graham; Sgt. C. Haddock; Sgt. A. Harris; Sgt. J. Harris; Sgt. W. Hatton; Flt. Sgt. V. Hill; Sgt. J. A. Hobbs; Sgt. L. J. Hopkins; Sgt. L. Illingworth; Sgt. W. B. Jamieson; F/O. M. P. Johnson; Sgt. J. Kelly; Sgt. G. Lee; Sgt. E. J. Lees; Flt. Lt. D. M. Leith-Hay-Clark; Sgt. R. A. Lewis; Sgt. R. W. S. McNally; Sgt. W. P. Maher; Sgt. A. J. Mason; F/O. R. J. Massie; Sgt. N. J. Meen; Sgt. S. T. Mills; Sgt. E. S. R. Norgrove; Sgt. J. Morris; Sgt. E. Moxen; Sgt. D. J. Nettle; Flt. Sgt. V. Nicholson, D.F.M.; P/O. A. T. Parker; Sgt. J. M. Parr; Sgt. D. H. Pether; Sgt. J. C. Pratt; Flt. Sgt. D. R. H. Rees; Act. Group Capt. B. V. Robinson, D.S.O., D.F.C., A.F.C.; Sgt. J. H. Rodgers; Sgt. P. W. Shale; Sgt. H. T. Simmonds; Flt. Sgt. E. G. A. Sotheron Estcourt; Flt. Sgt. A. J. Stone; Sgt. J. M. Stringfellow; P/O. J. Sutherst; Sgt. C. G. Taylor; F/O. D. W. B. Taylor; Sgt. G. Wallace; Sgt. D. S. Ward; F/O. C. B. Watt; F/O. J. A. Webb; Act. Flt. Lt. H. Webster, D.F.C.; W/O. J. L. Welch, D.F.M.; F/O. R. J. Widdecombe; Sgt. L. H. V. Wiles; Sgt. E. J. Williams; Sgt. R. Wilson.

Wounded or Injured in Action.—P/O. F. McK. Melville; Sgt. D. T. Mulligan.

Missing, Believed Killed in Action.—P/O. J. L. Athertom; Sgt. J. Buncher; Flt. Sgt. W. G. Clark; Flt. Sgt. G. W. Evans; Sgt. F. Glover; Sgt. J. Graham; Flt. Sgt. N. P. B. Green; Sgt. J. A. Hargreaves; Sgt E. J. N. Howell; F/O. J. Huggler; Sgt. K. W. Jackson; F/O. H. C. Lane; Sgt. J. McGlynn; Sgt. J. McQuater; Sgt. J. J. Opie; Act. Flt. Lt. L. Rothwell; Sgt. R. Russell; Sgt. J. W. Shaw; Sgt. J. F. Weatherell.

Missing.—Flt. Sgt. S. W. Ainsworth; Flt. Lt. R. G. Armstrong, D.F.C.; F/O. G. Baker; Sgt. R. J. Becherel; Flt. Sgt. J. Bengston; Sgt. J. Berry; F/O. G. A. Blair; F/O. A. Bennett; Sgt. J. A. W. Bodsworth; F/O. H. E. Botting; Sgt. R. H. Boulton; Sgt. R. J. Boyce; Sgt. H. G. Brady; Sgt. F. C. Brown; Sgt. F. P. Brown; Flt. Sgt. W. C. Bull; Sgt. J. R. Burgess; Sgt. J. H. Butler; Sgt. P. F. Butler; Flt. Sgt. C. H. Cannon; Sgt. D. J. Chick; Act. Flt. Lt. H. D. Churchill, D.F.C.; Sgt. J. T. Cockburn; Sgt. D. J. Cooper; Flt. Sgt. N. V. Creighton; W/O. C. W. Croft; P/O. A. E. S. Cooper; Sgt. L. Coughlan; Sgt. D. H. Cro; Sgt. E. A. Cryer; F/O. E. J. Dane; F/O. L. Durham; Sgt. C. Duthoit; Flt. Sgt. R. J. Eastabrook; P/O. T. S. Ecclestone; Sgt. D. E. Endean; Sgt. C. Farley; Act. Flt. L. G. Foley; F/O. J. D. Foster; Sgt. S. F. Foster; F/O. M. W. Frith; Sgt. P. D. Fry; Sgt. E. Fullerton; Flt. Lt. E. F. Garland, M.C.; Sgt. H. Goldberg; Sgt. D. A. Haden; F/O. R. E. Haddock; F/O. K. R. Hall; Sgt. T. Harris; Sgt. W. Harris; Sgt. W. F. Harrison; Sgt. E. H. Hastie; Sgt. D. Hayward, D.F.M.; F/O. A. A. Henry; Flt. Sgt. G. Hogg; Sgt. W. L. Holford; Sgt. A. S. Hollands; Flt. Sgt. K. Hunter; Flt. Sgt. N. Jackson; Sgt. R. A. Johnson; Flt. Sgt. E. S. Jones; Sgt. F. H. Joy; Sgt. P. Keenan; Sgt. S. McCallum; Flt. Sgt. J. G. McGarva; Sgt. R. Maile; Sgt. J. H. Maltby; Sgt. R. H. Martin; P/O. J. H. Mason; Sgt. J. Mellor; Sgt. R. J. Mitchell; P/O. R. Montgomery; Sgt. J. F. Moran; Flt. Sgt. W. A. Napier, D.F.M.; Sgt. C. A. Nash; Sgt. J. Oldfield; Flt. Sgt. R. G. Osborne; Sgt. J. W. L. Parker; Sgt. T. Parkin; Flt. Sgt. R. M. Patmore; Flt. Sgt. S. W. Payne; Sgt. R. A. Pearson; Flt. Lt. A. Pennington; Sgt. L. E. Pringle; Sgt. P. Renwick; Flt. Sgt. D. L. Reynolds; Sgt. A. J. Ridgway; P/O. P. F. Rowe; Sgt. K. Rowley; Sgt. L. P. Oughton; Flt. Sgt. A. C. Shenton; Sgt. J. H. Shimmin; P/O. C. D. A. Short; W/O. J. C. Smith; Sgt. M. B. Smith; Flt. Sgt. S. Smith; P/O. R. L. Squires; Sgt. C. Steele; Sgt. W. H. Stevenson; Flt. Sgt. J. E. Steward; Flt. Sgt. I. F. Stuart; Sqn. Ldr. H. Swanston; Sgt. A. Taylor; W/O. W. G. Teague, D.F.M.; Sgt. E. H. Thomas; Sgt. J. H. Thomas; Flt. Lt. R. C. Thorn; Sgt. J. G. Turnbull; Sgt. W. T. Viollet; P/O. D. A. Wadsworth; Flt Lt. L. N. Walsh; Flt. Sgt. J. J. Waters; Sgt. J. E. Watson; Sgt. R. F. Whinfield; Flt. Sgt. R. A. Wickham; Sgt. J. A. Williams; Sgt. G. R. Williamson; Sgt. W. G. Wood; W/O. D. A. Woodland; Flt. Sgt. B. T. Woolton-Woolley.

Missing, Believed Killed on Active Service.—Sgt. R. H. Asplin; Sgt. J. Greaves; Flt. Sgt. R. Herbert; Flt. Sgt. H. Turner; Flt. Lt. L. V. Walter; P/O. R. J. West.

Killed on Active Service.—A/C.2 F. L. Cochshott; Flt. Sgt. R. Elliott; Sgt. W. Jackson; P/O. R. C. R. Lean; Sgt. A. G. Pulfer; A/C.2 R. Portman; Sgt. N. V. Robson; F/O. C. H. Setterfield; Sgt. R. W. T. Smith; P/O. G. Williams; W/O. F. E. Wood; Sqn. Ldr. W. H. A. Wright.

Previously Reported Missing, Believed Killed on Active Service, Now Presumed Killed on Active Service.—F/O. J. R. Harrold; A/C.1 A. Parkinson.

Wounded or Injured on Active Service.—L.A/C. L. Dobson.

AIRBORNE INVESTITURE: Sgt. J. M. Duncan (left), and L.A/C. W. T. Keates, who were decorated by the King with the Royal Victorian Order Medal during His Majesty's return flight from Italy.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—Sgt. H. R. Farley; A/C.2 A. W. Rogers.

DIED ON ACTIVE SERVICE.—A/C.1 C. W. Davies; L.A/C. L. Jowett; L.A/C. F. H. L. Marsh; L.A/C. M. H. Pearson; Sqn. Ldr. W. J. Powell; L.A/C. V. R. Sturgeon; Act. Flt. Lt. D. C. E. Tovey; Flt. Lt. C. Walker.

Royal Australian Air Force

WOUNDED OR INJURED IN ACTION.—Act. Sqn. Ldr. J. E. Morphett, D.F.C.

MISSING.—Flt. Sgt. R. W. Ash; Flt. Sgt. D. R. Barr; W/O. R. H. Boyd; Flt. Sgt. J. H. Brown; P/O. H. D. Campbell; Flt. Sgt. I. Chapple; Flt. Sgt. G. M. Dann; Flt. Sgt. C. H. Eastgate; P/O. W. E. Felstead; Flt. Sgt. H. W. R. Ferguson; Flt. Sgt. B. G. Grasby; Flt. Sgt. M. J. Hackett; Flt. Sgt. W. S. Hancock; Flt. Sgt. R. H. Hobbs; F/O. G. O. Jones; P/O. W. J. Lewis; P/O. N. D. L. Lloyd; Flt. Sgt. L. G. McKenzie; W/O. D. H. McNaught; Flt. Sgt. W. C. Napier; Flt. Sgt. N. E. Parker; P/O. W. T. Peters; Act. Flt. Lt. E. McL. Scott; Flt. Sgt. W. A. Slade; Flt. Sgt. E. M. Thompson; F/O. A. E. Tyne; F/O. D. F. Ward.

MISSING, BELIEVED KILLED ON ACTIVE SERVICE.—Flt. Lt. B. S. Meyer.

KILLED ON ACTIVE SERVICE.—Flt. Sgt. T. R. Hampton.

Royal Canadian Air Force

KILLED IN ACTION.—P/O. G. S. Moore; F/O. W. D. Peacock; P/O. R. B. Ridley.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—P/O. J. M. Clark; Flt. Sgt. A. J. Fairall; F/O. P. H. W. Johnston.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. J. J. Cooke; Flt. Sgt. E. F. Sheehan; P/O. C. G. Wenzel.

MISSING.—Flt. Lt. A. A. Adams; P/O. R. G. Brock; P/O. R. D. Borrowes, D.F.C.; Flt. Sgt. E. R. Caldwell; W/O. J. N. C. R. Casaubon; Sgt. G. F. Casey; W/O. R. F. Cluff; F/O. W. E. Cummings; Sgt. I. I. Donovan; F/O. W. G. Dudley; F/O. A. Hinscliffe; W/O. J. C. Horne; W/O. L. T. Kennedy; Flt. Sgt. G. J. Langridge; Sgt. I. Larson; F/O. R. P. McKean; F/O. P. A. McLachlan; Flt. Lt. J. M. Mitchell; W/O. R. J. Montgomery; Sgt. T. H. Morris; Sgt. J. F. L. Perry; F/O. F. E. Pickering; F/O. H. W. Pond; W/O. B. F. Pothier; Sgt. J. R. Rankin; Flt. Sgt. J. A. Reynolds; P/O. R. H. Sparling; W/O. G. D. Spearman; W/O. R. A. Storbakken; F/O. C. W. E. Tiplady; F/O. E. F. Warren, D.F.M.

KILLED ON ACTIVE SERVICE.—F/O. W. G. Asbell; F/O. M. G. Henderson; W/O. J. I. W. A. Nadeau; P/O. J. M. Polomark.

Royal New Zealand Air Force

MISSING.—Flt. Sgt. R. Bailey; Flt. Sgt. R. A. Hodge; P/O. M. Lammas; P/O. J. A. Sanderson; Flt. Sgt. D. W. Vaughan.

South African Air Force

MISSING.—Lt. C. G. Leisegang.

Casualty Communique No. 414

Of the names in this list, 98 are second entries giving later information of casualties published in earlier lists.

Royal Air Force

KILLED IN ACTION.—Sgt. W. G. Anderson; Sgt. P. H. Bathmaker; F/O. J. R. Burton; Flt. Sgt. A. Gleghorn; Act. Sqn. Ldr. N. Glew; Act. Flt. Lt. J. M. Holder; W/O. B. B. Noble; Flt. Sgt E. J. Smith; Sgt. M. G. Smith; F/O. G. A. Turnage.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. W. H. Boyden; F/O. L. D. Clay; Sgt. R. K. Harrold; P/O. M. N. Hodson; Sgt. D. G. L. Jenkins; Sgt. A. J. Quar; Flt. Sgt. W. D. Sparks; Sgt. J. Taylor; Sgt. R. W. Threadgold; Sgt. D. G. Wood.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. J. McF. Acheson; P/O. J. Barthelemy; Wing Cdr. W. S. Barton, D.F.C.; P/O. F. W. Bateman; Sgt. W. M. Bladen; F/O. C. B. L. Bodger; Flt. Lt. J. O. Bostock; Sgt. W. L. Boundy; P/O. C. S. Burgess; P/O. D. C. Challis, D.F.M.; Sgt. W. Clark; Flt. Sgt. R. K. Cox; Sgt. A. H. Denton; Sgt. H. W. S. Ducklin; Sgt. D. M. Ellis; Flt. Sgt. E. Ewan; Act. Flt. Lt. A. E. Ferguson; Sgt. H. J. Ferrett; Flt. Sgt. P. T. Flanagan; Sgt. A. R. Fleming; Sgt. A. R. Harrup; Sgt. J. M. Healey; Sgt. F. A. Hitchcock; P/O. H. F. Hodges; F/O. R. W. Holdsworth; Sgt. R. J. Holmes; Sgt. R. W. Holmes; Sgt. J. V. Joyce; Sgt. G. C. King; Sgt. D. K. Lovesy; Sgt. K. Lyne; F/O. I. MacLean; Flt. Lt. G. C. R. Moody; Sgt. J. G. Noblett; Sgt. R. C. Paterson; Act. W/O. C. Phillips; Sgt. J. H. Phillips; Sgt. P. O. Pearson; Sgt. C. H. Pullum; Sgt. J. Pretsell; F/O. R. K. Pulling; Flt. Sgt. H. P. Robinson; F/O. G. R. Rowland; P/O. J. R. Scarles; Sgt. E. K. Sears; Flt. Sgt. H. Smith; Sgt. L. Tomlinson; Sgt. J. A. Town; Flt. Lt. R. M. Walmsley; Sgt. C. W. C. Waters; Sgt. B. West; Flt. Sgt. C. Whitfield.

WOUNDED OR INJURED IN ACTION.—P/O. J. W. Pitts; Sgt. J. O. Tanney.

DIED OF WOUNDS OR INJURIES RECEIVED IN ACTION.—Flt. Sgt. K. W. Adams.

PREVIOUSLY REPORTED MISSING, NOW REPORTED DIED OF WOUNDS OR INJURIES RECEIVED IN ACTION.—Flt. Sgt. E. L. Wilson.

LADIES FIRST : The first party of W.A.A.F.s to go to Normandy. They are, reading from left to right : L.A/CW. J. Davis, Cpl. J. Disney, Sgt. M. Easson, and S/O. J. Bradbury, and they will be on the clerical staff at A.E.A.F. H.Q.

MISSING, BELIEVED KILLED IN ACTION.—F/O. E. L. Germain; F/O. W. J. H. Rogers; Flt. Sgt. J. R. Spowart.

MISSING.—F/O. T. E. Archard; P/O. F. W. Baker; F/O. H. W. V. Bearne; Flt. Lt. G. Bell, D.F.C.; Sgt. A. M. Berry; F/O. P. R. Billingsley; Sgt. D. Bissett; Sgt. H. P. Black; F/O. J. Bradburn; Sgt. J. L. Bradburn; Sgt. A. G. Brooks; Sgt. C. T. Brown; P/O. M. A. Burnaby; Sgt. F. W. Burton; F/O. A. E. Carlton; P/O. S. Carlyle, D.F.M.; P/O. J. D. Carter; Sgt. D. A. Cato; Sgt. A. Clarence; F/O. A. G. Clarke, D.F.C.; Flt. Sgt. T. R. Clayton; Sgt. G. A. Coote; Sgt. R. J. Crawford; F/O. A. J. Cronch, D.F.M.; Sgt. R. M. Dand; Sgt. J. D. Dickens; Flt. Sgt. L. Diggle; Sgt. H. C. Dixey; Sgt. M. H. Duffy; P/O. S. A. Edwards; P/O. D. C. Fraser; Flt. Sgt. R. S. Garrod; P/O. G. P. Gillard; Sgt. G. E. Gilpin; Flt. Sgt. H. Grant; Sgt. A. F. Hamilton; P/O. A. Handley; F/O. S. J. Hanney; P/O. R. S. Hanson; Sgt. T. S. Hayhurst; Flt. Sgt. R. Heap; Sgt. E. R. Hill; Flt. Sgt. G. J. Hill; Sgt. R. E. Hogan; Sgt. J. W. Hooper; Sgt E. B. Hudson; Flt. Sgt. L. F. Hughes; Sgt. E. S. Hutchinson; P/O. D. S. Jackson; Sgt. L. Johnson; Sgt. M. A. Johnson; Sgt. A. H. Jones; Flt. Lt. J. A. Kead; Sgt. H. M. Kent; Sgt. A. C. Law; W/O. G. R. Leiper; Sgt. G. Long; Flt. Sgt. H. MacLeod; Sgt. H. W. Matthews; Sgt. W. C. Maxwell; F/O. L. Moody, Flt. Lt. G. E. Mortimer, D.F.M.; Sgt. F. F. Naismith; F/O. J. Newcombe; F/O. A. J. Newton, D.F.M.; P/O. G. H. Norman; Sgt. G. H. Norton; Sgt. G. E. O'Neill; F/O. J. H. Ormrod; Sgt. T. Oulton; Flt. Sgt. J. Parker; Sgt. H. M. Peckett; Sgt. C. F. Pope; Sgt. J. W. Ranger; Sgt. J. J. Read; Sgt. K. N. Read; Flt. Sgt. R. Reading; F/O. H. D. Reeder, D.F.C.; Sgt. W. Richardson; F/O. H. A. Rider; Sgt. A. F. Rowlands; Sgt. D. H. Ryder; F/O. C. W. Saunderson; F/O. R. A. F. Scrivener; Sgt. F. C. Searle; Sqn. Ldr. N. L. Shove, D.F.C.; Sgt. A. P. Simpson; F/O. N. A. Smith; Sgt. R. A. Sneddon; Flt. Sgt. E. F. Stannett; F/O. C. H. Stewart, D.F.C.; F/O. J. A. Stewart, D.F.C.; Sgt. J. A. I. Sutton; Sgt. K. H. Tabor; F/O. R. J. Ward; Sgt. R. Webster; Sgt. M. T. Wheeler; Flt. Lt. L. L. Whitaker, D.F.C.; Sgt. C. Whitelock; P/O. C. L. Woolley.

KILLED ON ACTIVE SERVICE.—F/O. P. D. Bruce; L.A/C. W. J. Clegg; L.A/C. V. J. T. Cooke; P/O. R. L. Double, D.F.M.; W/O. R. Hardie; Sgt. M. G. Hudston; P/O. G. J. H. Hughes; Sgt. W. J. Hunter; Sgt. G. T. Jones; L.A/C. H. Laidlaw; F/O. A. C. E. Lance; P/O. N. Liddle; Sgt. F. J. Luxford; Sgt. D. McDermott; P/O. F. E. W. Mayhew; Flt. Lt. J. H. T. Metcalf; F/O. H. Moran; Sgt. D. Motherwell; Flt. Lt. M. J. D. O'Leary, D.F.C.; Sgt. J. R. Pettit; W/O. G. M. Postlethwaite; F/O. H. Pullan; L.A/C. A. G. Pycroft; Flt. Sgt. P. H. Rockingham; Sgt. D. W. Smith; Sgt. E. T. Stephenson; F/O. H. Stewart; Sgt. D. Sutcliffe; A/C.2 R. J. Underwood; F/O. R. D. Warren; F/O. J. J. White; Sgt. D. I. Whitney; Sgt. E. A. Wilmshurst.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED ON ACTIVE SERVICE.—L.A/C. H. R. Leeks; Sgt. J. G. Lysaght; Flt. Sgt. A. S. McPherson; L.A/C. P. Stewart.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—W/O. D. C. B. Riddick.

DIED ON ACTIVE SERVICE.—L.A/C. F. Bryant; L.A/C. E. Burgess; A/C.1 L. Collins; L.A/C. R. R. Dimbleby; Act. Flt. Lt. V. J. Dodd; L.A/C. J. A. Gilchrist; A/C.1 H. Henwood; A/C.2 F. A. Horwood; L.A/C. R. McKelvie; L.A/C. C. W. Parratt; Flt. Sgt. R. G. Poland; Act. Cpl. H. Randle; L.A/C. C. W. Reeves; A/C.2 S. T. J. Smith; L.A/C. W. Tyrer; Flt. Sgt. A. J. Welsh.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR.—Flt. Sgt. P. J. Barraball; Sgt. T. Boyd; F/O. A. Bradshaw, D.F.C., Flt. Sgt. J. S. Carnill; Flt. Sgt. D. C. Carter; Act. Sqn. Ldr. A. P. Jones; F/O. R. R. Last; L.A/C. H. Lee; Sgt. D. H. Lockyer; Flt. Sgt. J. S. Whittle.

Women's Auxiliary Air Force

DIED ON ACTIVE SERVICE.—L.A/CW. R. W. Haywood; L.A/CW. J. Strickland.

Royal Australian Air Force

KILLED IN ACTION.—Flt. Sgt. M. Dunbar.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. R. L. Nott; P/O. R. J. Ratcliffe.

MISSING.—Flt. Sgt. G. C. Barber; F/O. L. V. Barnett; F/O. L. E. J. F. Chinnery; W/O. D. E. Close; Flt. Sgt. D. J. Dyson; Flt. Sgt. W. K. Gertzel; Flt. Sgt. W. A. Gillard; F/O. E. Hourigan; F/O. J. H. Irwin; Flt. Sgt. A. D. Johnston; W/O. H. J. Long; Flt. Sgt. G. F. Pate; Flt. Sgt. R. W. Perry; F/O. G. P. Pinn; W/O. R. W. Purcell; P/O. J. W. Smart; Act. Sqn. Ldr. D. P. S. Smith; Flt. Sgt. H. J. Smith; W/O. C. R. Stevenson; P/O. R. H. Watts; Flt. Sgt. W. J. White.

KILLED ON ACTIVE SERVICE.—Flt. Sgt. W. B. Burton; F/O. J. R. Dixon; P/O. R. W. Dunn; Flt. Sgt. R. W. Ely; W/O. H. E. Hughes; Flt. Sgt. N. J. Knight; Flt. Sgt. T. R. Laver; Flt. Sgt. W. J. Lea; F/O. J. D. McClure; Flt. Sgt. J. S. McInnes; Flt. Sgt. R. B. Morrison; Flt. Sgt. J. Roper; F/O. A. Roulston; Flt. Sgt. B. K. Storer.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTIVE SERVICE.—Sgt. R. F. Jenkins.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR.—Flt. Sgt. R. D. Hughes; F/O. C. G. Phelps.

Royal Canadian Air Force

KILLED IN ACTION.—W/O. O. J. Albrecht; F/O. K. S. Johnson; Sgt. J. A. Lanouette; Sgt. G. K. McLellan; F/O. G. S. Oliphant; W/O. J. Tass.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—F/O. A. E. Beyak; F/O. A. Chornenko; Sgt. R. M. Fournier; Flt. Sgt. G. W. Howard; Sgt. C. C. Smith.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. J. W. White.

MISSING.—P/O. P. J. W. Barkway; W/O. W. W. Bigoray, D.F.M.; F/O. R. O. Ellsmere; Flt. Sgt. G. H. Hobson; Sgt. E. Houlden; W/O. J. M. B. Liebscher; Flt. Lt. S. C. McDonald; P/O. R. E. MacFarlane; F/O. J. A. McIntyre; Sgt. W. B. Martin; Sgt. O. Molzan; Sgt. A. B. Moore; Sgt. J. K. Morey; F/O. W. E. Parsons; Sgt. D. T. Serviss; F/O. A. M. Shannon; P/O. J. E. Shepherd; Flt. Sgt. W. H. Thompson; Flt. Sgt. G. R. Warnock; P/O. G. M. Weaver; W/O. R. D. Weller.

KILLED ON ACTIVE SERVICE.—Sgt. N. F. Alson; F/O. R. W. Bartlett; P/O. D. D. G. Bidwell; W/O. J. W. Clark; W/O. H. G. Grice; Sgt. R. W. Hare; Sgt. H. W. Ingleson; P/O. J. G. McMa-

SERVICE AVIATION

ter; Sgt. F. A. Milne; Flt. Sgt. E. M. Parsons; F/O. A. A. Tilton.

WOUNDED OR INJURED ON ACTIVE SERVICE.—F/O. J. E. McGowan.

DIED ON ACTIVE SERVICE.—Group Capt. W. A. Jones.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR.—F/O. E. N. Bell; W/O. T. Bowskill; F/O. J. L. McKeown.

Royal New Zealand Air Force

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. B. P. Higginson; F/O. F. J. Hunter.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTON.—Flt. Sgt. F. W. Bacon; P/O. F. McD. Poole; F/O. W. G. Smith; F/O. J. G. Turnbull; Flt. Sgt. G. H. B. Wilkie.

DIED OF WOUNDS OR INJURIES RECEIVED IN ACTION.—Flt. Sgt. J. B. Winter.

MISSING.—Act. Flt. Lt. C. H. Masters; P/O. A. G. Stafford.

KILLED ON ACTIVE SERVICE.—W/O. A. H. Marsh.

South African Air Force

KILLED ON ACTIVE SERVICE.—2 Lt. H. A. Whitcher.

Southern Rhodesian Air Force

MISSING.—Flt. Lt. P. H. C. Theodosiou.

Casualty Communiqué No. 415

Of the names in this list 97 are second entries giving later information of casualties published in earlier lists.

Royal Air Force

KILLED IN ACTION.—Flt. Sgt. A. S. Aird; Flt. Sgt. P. L. Bell; Flt. Sgt. A. E. Nash; Flt. Lt. A. E. Meadows.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. A. R. Bangs; Flt. Lt. F. B. Bidulph; Flt. Sgt. A. R. Brace; Flt. Lt. C. H. Cleveland; Sgt. F. Ellick; Act. Flt. Lt. G. Hamilton; Sgt. N. J. E. Wheeler.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. H. D. Bean; Sgt. S. K. Blandford; Sgt. T. Brownless; Flt. Sgt. W. Caldwell; Sgt. A. E. Chalk; Sgt. A. Cousins; Sgt. D. L. Cowling; F/O. E. R. Davies; Sgt. G. A. Filleul; Sgt. C. B. Francis; Sgt. H. Fulton; Sgt. H. Gardner; Sgt. K. Gilbey; Sgt. C. H. Glover; Sgt. K. F. Goode; Sgt. A. F. Gregory; Sgt. H. Hadfield; Sqn. Ldr. G. E. Hawkins; Sgt. R. L. Jones; Sgt. K. W. Langstaff; Sgt. G. S. Maddocks; Sgt. P. W. Metcalfe; Sgt. A. J. H. Millin; P/O. G. A. N. Parker; Sgt. S. J. Passey; Sgt. F. E. Pilkington; Sgt. S. T. Pitt; P/O. D. Ridgway; Sgt. E. J. Smith; Sgt. J. Thomas; Sqn. Ldr. F. W. S. Turner, D.F.C.; Flt. Sgt. H. M. Valentine; P/O. J. Weaver; Sgt. R. A. Williams; Sgt. R. Wray.

WOUNDED OR INJURED IN ACTION.—Flt. Lt. C. E. Broad, D.F.C.; Flt. Sgt. D. J. Price.

MISSING, BELIEVED KILLED IN ACTION.—Flt. Sgt. L. E. Williams.

MISSING.—Sgt. J. O. Ackroyd; Flt. Sgt. M. E. Agar; F/O. O. L. Albutt; Act. W/O. E. A. Aldred; Sgt. R. W. Andrews; Sgt. K. Applegarth; Flt. Lt. B. Atkinson; F/O. R. Avery; Sgt. R. B. Barker; F/O. H. W. Batt; Sgt. G. W. Beer; P/O. C. Bell; Sgt. R. F. Bickford; F/O. J. R. Brookes; Sgt. A. W. Burton; F/O. W. H. I. Cameron; Sgt. H. S. Chappell; Sgt. F. C. Clarke; Sgt. R. W. Clarke; F/O. D. M. Cleeve; Sgt. A. P. Cochrane; Sgt. E. C. Cottrell; Flt. Sgt. R. J. Cross; Flt. Sgt. W. Currie; Sgt. R. E. Dance; Flt. Sgt. R. Dawes; Sgt. H. H. Dixon; Sgt. C. N. G. Drew; Sgt. F. F. Dring; Sgt. F. R. Dye; Sgt. A. Eland; Sgt. J. Ellis; Sgt. G. Ellwood; P/O. C. Elton; Sgt. B. Escritt; Sgt. N. E. Fay; Sgt. J. T. Fenton; Flt. Sgt. L. P. Fidgin; Sgt. C. W. Finlayson; Flt. Sgt. W. A. C. Footman; Sgt. H. Forbes; Flt. Sgt. C. V. Fox; Flt. Lt. N. H. Fredman; Flt. Sgt. F. S. Freeman; Sgt. K. R. Gandy; Sgt. K. Garner; P/O. K. Goodwin; Flt. Sgt. W. G. Goodwin; Sgt. C. G. Graham; Act. Flt. Lt. A. J. Grain, D.F.M.; Sqn. Ldr. J. R. Grant; Act. Sqn. Ldr. R. W. H. Gray; Flt. Sgt. P. E. Green; F/O. J. Guile; Flt. Sgt. R. J. Harman; P/O. S. Hewitt; Sgt. R. E. Hickling; P/O. J. E. Holden; Sgt. J. H. Holloway; Flt. Sgt. F. N. Holmes; Sgt. W. W. Hopper; F/O. J. F. Ineson; Sgt. J. R. Ingham; Sgt. H. M. Jennings; Flt. Sgt. G. C. Jennison; Flt. Sgt. E. Johnson; Sgt. J. R. Johnston; Flt. Sgt. N. W. Johnstone; Sgt. W. A. Jones; Sgt. H. C. Jones; Sgt. W. R. Kennedy; Flt. Lt. W. B. Laidlaw; Flt. Sgt. S. Levy; Sgt. E. Long; Sgt. R. G. Lovegrove; F/O. C. H. Lowcock; P/O. N. McA. McGaw; Sgt. R. Mansbridge; Sgt. J. A. A. Mansfield; Sgt. K. V. Mant; Sgt. L. C. Margetts; F/O. D. C. Martin; F/O. L. F. Medway; Flt. Sgt. R. A. Menday; Sgt. J. E. Moore; Sgt. R. A. Moore; Flt. Lt. F. Mountain; Flt. Lt. R. M. Muir, D.F.C.; F/O. T. W. Munro; Sgt. H. J. Norman; Sgt. J. E. Normington; Flt. Sgt. K. A. Oswald; P/O. J. Parkinson; Sgt. W. G. Parry; Sgt. R. J. E. Pask; Sgt. E. G. R. Pepper; Sgt. A. D. Poole; Sgt. C. Potten; Sgt. F. L. Preece; Sgt. J. R. Presland; Sgt. A. F. Raymond; Sgt. H. P. Robinson; P/O. J. Rodgerson; Flt. Sgt. E. Rosenfield; Sgt. F. R. Rowe; Flt. Sgt. R. Rowell; Sgt. R. G. S. Russell; Flt. Sgt. R. Satchell; Sgt. M. C. Sewell; F/O. R. J. Shaw; Sgt. R. Shipley; Sgt. E. K. Slattery; Sgt. A. S. Smith; Sgt. J. Stanley; Act. Sqn. Ldr. H. B. Stephens, D.F.C.; Flt. Sgt. W. Stobbart; Sgt. F. Stormont; F/O. L. Sumner; Sgt. T. W. Sykes; Sgt. E. E. Tabner; Sgt. R. J. Tailby; Sgt. W. C. Taylor; Sgt. F. A. Towse; Sgt. A. R. Tranter; P/O. S. Waller; Sgt. H. R. Warren; Sgt. D. J. White; Sgt. J. Wilkinson; P/O. S. H. Willes; Sgt. G. W. Wilson; Sgt. R. A. Wilson; F/O. L. A. Wright.

MISSING, BELIEVED KILLED ON ACTIVE SERVICE.—Sgt. V. G. Childs; Sgt. W. H. Lamond; A/C.1 G. Robinson; Flt. Sgt. N. Turner; Sgt. V. Wadmore; Sgt. P. F. Whale; Sgt. A. Whitehead; Sgt. W. Winkley.

KILLED ON ACTIVE SERVICE.—Act. Sqn. Ldr. C. R. Adam; F/O. D. C. Alderwood; Cpl. H. Barlow; Sgt. F. J. Bassett; Act. Sqn. Ldr. H. C. Caldwell; P/O. K. E. Chambers; W/O. D. J. R. Clyne; Sgt. P. W. N. Hine; P/O. F. G. Newport; Sgt. D. S. Smith; P/O. J. M. Slater; Flt. Sgt. D. R. Ward.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED ON ACTIVE SERVICE, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Sgt. D. T. W. Cammies.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. A. R. Anstey; A/C.1 V. J. Brown; Cpl. H. Farish; L.A/C. R. Gill; L.A/C. S. Hammett; Sgt. T. James; Sgt. E. A. Kilshaw; L.A/C. D. C. Roberts.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—F/O. J. H. Zanzottera.

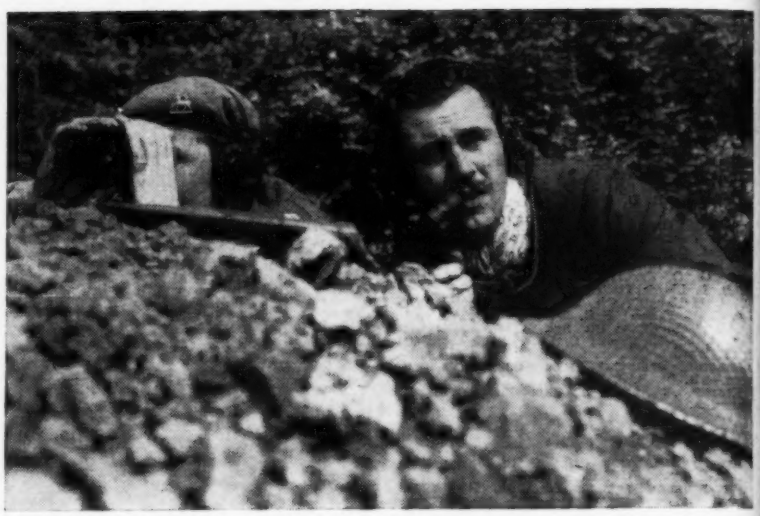
DIED ON ACTIVE SERVICE.—L.A/C. A. Bagnall; Sgt. A. G. Barber; L.A/C. F. L. Bond; Act. Sqn. Ldr. W. H. Broom; A/C.2 R. B. Clewes; L.A/C. S. A. Crouch-Baker; L.A/C. E. D. Davies; A/C.1 F. K. Drake; Sgt. J. E. Frogley; Sgt. A. P. Gudger; L.A/C. L. P. Gwillim; P/O. G. S. Howorth; Sgt. A. G. Lee; L.A/C. W. C. A. Lovegrove; W/O. J. Maddison; Wing Cdr. B. N. Matson; L.A/C. R. Nall; P/O. P. A. Nash; Cpl. H. Smerdon; A/C.2 J. S. Spowart; W/O. A. R. Stratton; L.A/C. R. C. Vickers; Cpl. J. Wiseman.

Royal Australian Air Force

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. G. C. Fowler; F/O. C. C. Godley; Flt. Sgt. A. Hooker; Flt. Sgt. J. R. Ivory; F/O. A. J. Johnson; Flt. Sgt. A. Lane; Flt. Sgt. L. J. Naile; F/O. P. T. O'Farrell; Sgt. J. E. Paterson; P/O. H. E. M. Plant; Flt. Sgt. D. A. Reid; Flt. Sgt. R. W. Richards; Flt. Sgt. E. A. Sims; F/O. J. C. Valder; Flt. Sgt. C. D. Ward; Flt. Sgt. A. C. Wiltshire.

MISSING.—W/O. A. H. Biltoft; Flt. Sgt. D. A. Bowern; P/O. D. A. Chapple; Flt. Sgt. G. A. Clyne; Flt. Sgt. W. R. Elgar; Flt. Sgt. J. A. Ford; Flt. Sgt. H. J. G. Fry; P/O. E. H. Gaggin; Flt. Sgt. C. S. Gay; Flt. Sgt. W. Hodgson; Flt. Sgt. A. R. Jackson; Flt. Sgt. J. J. Lawton; Flt. Sgt. N. E. Locklier; Flt. Sgt. J. W. McLeod; Flt. Sgt. P. W. Nicholls; W/O. L. J. Nichols; P/O. K. R. Warren; Flt. Sgt. J. A. J. Whitburn; Flt. Sgt. T. C. White.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED ON ACTIVE SERVICE, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Flt. Sgt. F. A. Noonan; Sgt. L. J. Power.



GUIDING THE ATTACK: Sqn. Ldr. R. A. Sutherland, D.F.C., and Maj. C. Gray in a Visual Control Point in Normandy. The job of these men is to direct the attacking close-support aircraft to the selected targets, and then report the results back to Brigade and R.A.F. H.Q.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Flt. Sgt. A. H. McFarlane.

Royal Canadian Air Force

KILLED IN ACTION.—W/O. J. G. H. Magill.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. J. A. Albert; F/O. C. M. Butcher; Flt. Sgt. P. S. Camsell; W/O. J. J. McLean; Sgt. J. M. Morrison; F/O. L. C. Pitman.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. M. J. Bovaconti; Flt. Sgt. E. C. Bray; Flt. Sgt. E. B. Capin; Sgt. E. A. Cannon; F/O. P. H. Coates; Flt. Sgt. R. W. Collins; Flt. Sgt. M. C. Craik; F/O. J. W. Crowley; P/O. T. Dos Santos; Flt. Sgt. H. A. Green; W/O. A. Heaney; F/O. J. M. Lauder; F/O. E. V. Lee; Act. Flt. Lt. F. P. Marsh, D.F.C.; Sgt. R. Moore; Flt. Sgt. L. T. Olmstead; Flt. Sgt. N. L. Reed; Flt. Sgt. R. P. Reynolds; W/O. F. P. Sharpe; P/O. H. M. Smith; Sgt. L. A. Stemmler; P/O. V. A. Stewart; Flt. Sgt. T. R. H. Todhunter; P/O. G. P. C. Vandekerckhove, D.F.C.; Flt. Sgt. J. I. Wallner; Flt. Sgt. K. D. Wellwood; Flt. Sgt. D. D. Witts; F/O. R. T. Zdan.

MISSING.—F/O. J. B. Armstrong; Flt. Sgt. N. G. Baskerville; Flt. Lt. F. C. Bertelsen; Flt. Sgt. G. A. Coon; W/O. J. H. Ferguson; Sgt. F. C. Hoxford; P/O. J. G. Johnson; F/O. E. C. Jones; P/O. P. J. O. Lapointe; Sgt. A. A. McCallum; Sgt. J. H. DacDougall; P/O. H. F. MacKenzie; P/O. E. W. Michie; W/O. R. J. J. Monaghan; F/O. D. Moriarty; F/O. M. R. Oliver; W/O. C. J. E. O'Neill; F/O. J. L. Ritchie; Flt. Sgt. G. A. Schwerdfeger; Sgt. H. E. Simmons; Sgt. T. S. Winstanley.

MISSING, BELIEVED KILLED ON ACTIVE SERVICE.—W/O. R. F. Easen.

KILLED ON ACTIVE SERVICE.—Sgt. W. T. Falan.

Royal New Zealand Air Force

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—P/O. R. Fuggle, D.F.M.; W/O. L. M. Goldsmith.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. L. A. Squire.

WOUNDED OR INJURED IN ACTION.—W/O. M. L. Langley.

MISSING.—P/O. J. M. Aitken; F/O. D. A. Goulden; F/O. I. A. Pettitt; F/O. E. V. Sage; Act. Flt. Lt. J. M. Shearer; Flt. Sgt. A. L. F. Wright.

South African Air Force

MISSING, BELIEVED KILLED IN ACTION.—Lt. D. J. De Villiers.

MISSING.—Maj. H. A. Job; Lt. A. P. Plignault; Lt. R. M. P. Stuart; 2/Lt. P. J. Van Staden.

KILLED ON ACTIVE SERVICE.—2/Lt. L. E. Harris.

Air Transport Auxiliary

Flt. Capt. The Hon. Mrs. MARGARET FAIRWEATHER, A.T.A., died from injuries sustained whilst flying His Majesty's aircraft in England.

944

Gray
t the
esults

ow Pre-
Flt. Sgt.

orce
Magill.
Believed
illed in
. M. But-
McLean;
n.
ow Pre-
. J. Bova-
B. Capin;
Flt. Sgt.
/O. J. W
gt. H. A.
Lauder;
P. Marsh,
Olmstead;
P. Rey-
M. Smith;
wart; Flt.
C. Vande-
llner; Flt.
itts; F/O

Flt. Sgt.
lsen; Flt.
Sgt. F. C.
C. Jones;
McCallum;
MacKenzie;
Monaghan;
er; W/O.
Flt. Sgt.
mons; Sgt.

tive Ser-

T. Falan.

Force
Believed
Killed in
/O. L. M.
Now Pre-
gt. L. A.
W/O. M. L.
O. D. A.
V. Sage;
A. L. F.

orce
ction.—Lt.
Plignault;
Staden.
Lt. L. E.

iliary
aret Fair-
sustained
England.